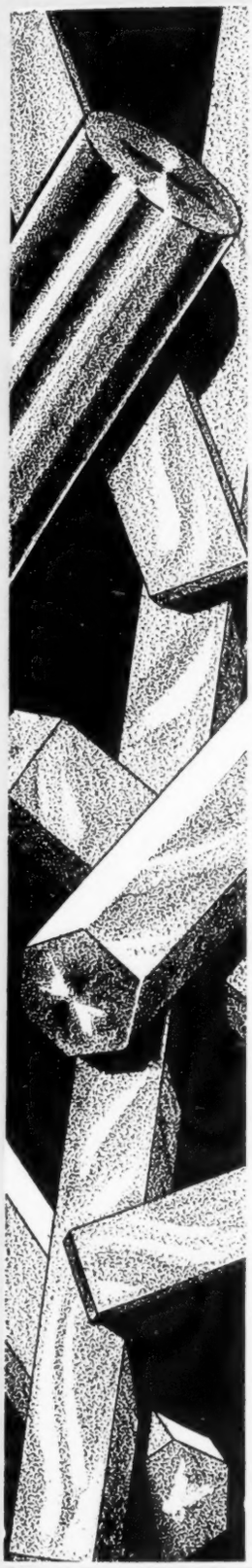
IRON TRADE REVIEW
STEEL
August 28, 1930



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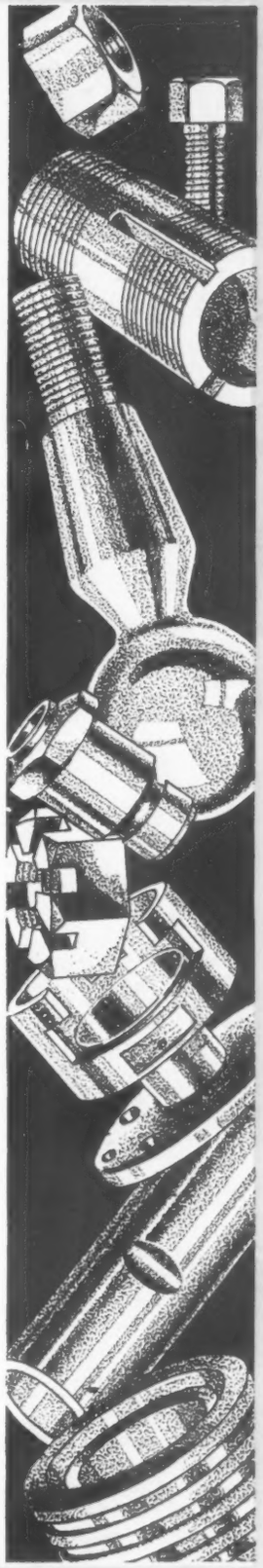

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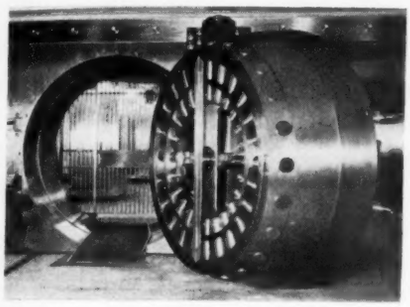

Building Larger Bank Vaults and Doors of Chrome Steel. Page 46.

THIS WEEK:

A NEW mill building 2000 feet long has become part of the iron and steel "structure" in Indiana Harbor, Ind. The building houses the 10-inch merchant bar mill of the Inland Steel Co. Building and mill have been under construction for more than a year, and, appearing complete and ready for business at this period, testify to the confidence and courage which are part of the industry. An interesting description appears on page 43. The mill comprises 15 stands in line. Finishing speed is at the rate of 2000 feet per minute.

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Volume 87 Number 9

IRON TRADE REVIEW
STEEL

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

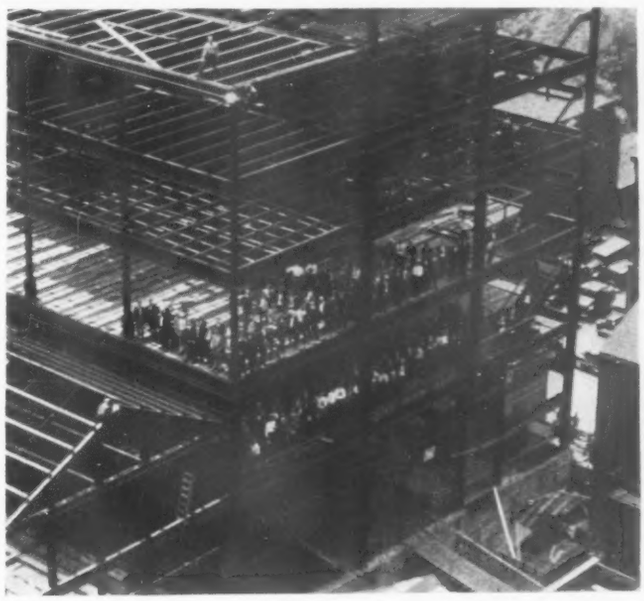
AMERICANS receive most of their impression of soviet Russia from the character and actions of communists in this country. When it is viewed through the eyes of some of our engineers who have spent years among the Russian people and their leaders, opinions in regard to it may be altogether different. If the soviet government could silence all the inflammatory talk of the "reds" outside its borders, and let the engineers speak for it, telling what they know from actual experience, it would go farther toward promoting a liberal attitude. If its philosopher-statesmen could realize that what might be best for the Russian people is not suitable for those of this western world they would win more sympathy and support. An American engineer evidently has been telling them that, but though they may be attentive, there is the Third Internationale in Moscow, and it cannot be muzzled without trouble. During the past seven or eight years more than $600,000,000 in trade has been transacted between America and Russia (Page 35). The truth must be known, says this engineer, in regard to "the world's greatest human experiment." Workers are beginning to be paid according to their abilities, a hopeful sign . . . meanwhile Russian manganese ore continues to be a bone of contention in this country. Steelmakers go to Washington to resist the efforts of domestic producers to raise the bars against the soviet product (Page 25). . . . Our iron and steel imports and exports fall to the lowest point in five years (Page 26).

Merger Hearing in Ninth Week

Republic Steel Corp. announces work is to start soon on a $1,000,000 expansion program in its open-hearth department in Youngstown, O. (Page 24) . . . while one of its principal organizers, Cyrus S. Eaton, resumes the witness stand in the ninth week of the Bethlehem-Sheet & Tube merger hearing in common pleas court at Youngstown. Attorney Newton D. Baker, of counsel for the Bethlehem-Sheet & Tube merger group, wants Judge Jenkins to know all the ins-and-outs of the mergers Mr. Eaton effected before he interposed objection to Bethlehem-Sheet & Tube (Page 23). . . . Pipe manufacturers will save $2,000,000 to $3,000,000 annually in their freight bill on shipments to the Southwest, if the interstate commerce commission adopts the recommendation of one of its examiners in a case pending since 1928 (Page 30). . . . William G. Clyde resigns as president, Carnegie Steel Co., because of ill health, and is succeeded by I. Lamont Hughes, vice president in charge of operations for the United States Steel Corp. Mr. Hughes, identified with the steel industry 33 years, is said to walk to his office nearly every day (Page 29).

Four Steel Leaders Among «Rulers»

The cablegram from London remarks the quiet state of the British iron and steel indus-



Pittsburgh chapter, Association of Iron and Steel Electrical Engineers, inspects Central Engineering Laboratory, largest arc-welded building in the world, now under construction at East Pittsburgh plant, Westinghouse Electric & Mfg. Co.

try is emphasized by "the race week holiday" (Page 94) . . .while James W. Gerard, formerly ambassador to Germany, declares if Britain had the 40 men who "rule the United States" in ten years its per capita wealth would exceed that of any other nation . . . (Page 24). He qualifies it with the proviso that Britain adopt the Beaverbrook tariff plan—free trade in the empire, high protection against all others. These 40 men are to go to Britain and in ten years break down an iron mountain of conservatism such as they never had to contend with here. "Carrying coals to Newcastle" has not yet begun for England, but Henry Ford is arranging to ship Newfoundland iron ore 2000 miles to his British subsidiary (Page 60). . . . Britain losing steadily in competition with foreign countries must import half her ore. We have the Monroe doctrine, and British and Germans must not acquire territory on this side, but that has not prevented them from coming to South America and preparing to haul away much of the valuable ore (Page 34) . . . Distribution of raw materials shows the world's interests are interlocked. We consume 60 per cent of the world's output of chromite ore, produce none (Page 45) . . . Progress seldom comes through retaliation. The British preferential tariff has just caused us the loss of 2500 tons of steel for penstocks for a Canadian pulp and paper mill. Heretofore all such tonnage has gone to Pittsburgh (Page 24).

Steel Produced in Detroit District

Basic open-hearth steel is poured for the first time in the Detroit district, by the Great Lakes Steel Corp., subsidiary of the National Steel Corp. (Page 33) . . . and Inland Steel Co.'s new 10-inch merchant bar mill, Indiana Harbor, Ind., is completed, increasing the Chicago district capacity for the smaller sizes of rounds, flats, squares, shapes; bands and coiled stock (Page 43). . . . In drawing ¼-inch low-carbon wire rod down to 0.199-inch in one operation an eastern manufacturer finds that by using tungsten-carbide dies the machine can be speeded up from 55 to 80 revolutions per minute, a single die producing approximately 200,000 pounds of wire. Despite the high cost of the dies their use is reported economical, and a superior finish is imparted to the wire (Page 50). . . . Six overhead electric travelling cranes to be installed in the new sheet mills of the United States Aluminum Co., Alcoa, Tenn., are constructed largely of rolled sections and castings of aluminum alloy. The bridge in each is of latticed-type girder construction. A 10-ton crane weighs 30,000 pounds; made of steel it would weigh 77,100 pounds (Page 52). . . . Costs of grinding billets to remove surface defects have varied widely and until recently no attempt has been made to determine a base for comparisons. If all items such as efficiency of grinding wheel, labor effort, type and condition of steel remain constant, and a weight adjustment factor is used, the cost per ton of billets will not fluctuate, and all sizes can be ground at the same cost per ton (Page 54).

Steel River Shipments at High Point

River shipments of iron and steel products in the Pittsburgh district for the first seven months this year, 1,447,656 tons, are the largest in history. Excepting 1928, this seven-months traffic is heavier than that for any other full year. (Page 27). . . . Increasing use of inland waterways following recent improvements evidently is encouraging the government. The Ohio river-Lake Erie canal project is revived, with federal engineers surveying a new route that would provide a two-way traffic for coal, ore and finished products through the Shenango and Mahoning valleys (Page 71). . . . July automobile production, 262,363 units, is only 52.8 per cent of the output of 500,840 in July of last year (Page 27). . . . The aircraft industry is quickly developing gigantic stature while we are thinking of it as something to come in the future. Current reports of the 1929 census of manufacture reveal the value of the industry's output as $61,973,000, an increase of 193 per cent in two years. The cost of materials used by the 117 establishments last year was $24,720,000 (Page 79). . . . Vanadium alloy steels, and their various commercial applications are discussed in the second article of a series now running in STEEL (Page 47).

Employe Stock Plans Strengthened

A system of registration—when you employ a man and when you lay him off—may be adopted in this country as the simplest means of keeping a record of unemployment. The number of those "out of a job, able to work and looking for a job," census day, April 1, in 28 states was 2.06 per cent of their population, a slightly higher average than an earlier estimate. On this basis 2,527,281 persons in the whole United States were idle (Page 30). . . . Communists are to make Labor day an occasion for demanding "social insurance," or doles, for the unemployed (Page 30). . . . The 5,000,000 or more employe stockholders in this country with securities in the companies for which they work lost nothing in the stock market crash, due to the prices of the stock and the absence of speculation. A Conference board survey shows increased confidence in such plans; that they are sound, some new issues oversubscribed (Page 30). . . . Steel guards wealth; the massive bank vaults require surprisingly heavy tonnages of torch-resisting plates and special castings. Vaults and doors for the Irving Trust Co., New York, will take nearly 2000 tons. But the world's largest will be installed in Tokio, and 3500 tons of steel will be used (Page 46).

More Steel Mergers Being Considered, Eaton Testifies

CYRUS S. EATON, chief opponent of the Bethlehem-Sheet & Tube merger, in common pleas court in Youngstown, O., Tuesday declared negotiations for more mergers in the steel industry are being discussed. When pressed for additional information by Attorney Newton D. Baker, representing Sheet & Tube, Mr. Eaton refused to divulge any details, and in this he was protected by Judge David G. Jenkins, who is hearing the case to block the Bethlehem-Sheet & Tube merger.

Mr. Eaton had been on the stand nearly every court day for the past week, this being the ninth week of the trial. He was being cross-examined by Attorney Baker, who is centering his efforts on obtaining all the facts pertaining Mr. Eaton's financial transactions whereby he succeeded in organizing the Republic Steel Corp. The idea of the Republic merger, he testified, originated with the late E. T. McCleary when he was president of the Republic Iron & Steel Co. The plan developed when Mr. Eaton had conferences with F. J. Griffiths and Benjamin Fairless, of Central Alloy Steel Corp., regarding the manufacture of tubes of alloy steel by the new electric welding process. The Bourne-Fuller Co. was included in the merger at Mr. McCleary's suggestion, because in making nuts and bolts it was competing with Republic.

Overruled Mr. McCleary

Mr. Eaton said he repeatedly overruled suggestions by Mr. McCleary that Republic and the Youngstown Sheet & Tube Co. be merged. He believed it unwise after consulting his associates, especially in view of the fact Sheet & Tube was negotiating with Inland Steel Co.

Previously Mr. Eaton testified that John T. Harrington, president, Trumbull Steel Co., developed the idea of a Trumbull-Republic merger, which was to be followed later by a merger with Inland. Mr. Harrington, he said, was much disappointed when James A. Campbell, Sheet & Tube chairman, stepped into the Inland merger picture. Otis & Co., with which Mr. Eaton is associated, bought with $775,000 of Trumbull money a total of 20,000 shares of Republic Iron & Steel, and an equal number of Inland shares on margin, this stock finally being enhanced in value by $775,000.

Mr. Eaton last week told how he first came to be interested in the steel industry in 1922, what he did to rehabilitate the Trumbull Steel Co.'s properties, later how he became a stockholder and still later a director in Sheet & Tube, took a hand in negotiations to merge Inland Steel and Sheet & Tube, and of his "astonishment" when he was told Inland merger negotiations were off.

He described the meeting in the office of Samuel Mather, of Pickands, Mather & Co., at Cleveland, with certain officers and directors of Sheet & Tube and Bethlehem when he tried vainly to argue them into delaying a vote on the Bethlehem merger proposal until further investigation could be made of the data submitted. He told vividly of his remarks made at the time, and the arguments he had made to retain the independence of the northern Ohio industrial district free from "eastern influences." On the witness stand he spoke freely of his views on the proposed Bethlehem-Sheet & Tube merger as he had expressed them to the directors and others.

Cyrus S. Eaton

Smiling, after a week on the witness stand in the Bethlehem-Sheet & Tube merger hearing, he intimates more steel mergers are pending

Flat denial was made by Mr. Eaton that he ever had told Sheet & Tube directors that he was "unalterably opposed" to the merger with Bethlehem; or that he ever had said he "had other plans in mind" for Sheet & Tube; or that he ever had "refused to look at the data" prepared for submission to him by Price, Waterhouse & Co., New York auditors, acting for Bethlehem.

All these matters had been testified to previously by Sheet & Tube directors.

Details of the second Inland merger nogotiations were given by Mr. Eaton. He said he had entered the negotiations at the suggestion of H. G. Dalton, Sheet & Tube director, who came to his office. At that time he was a stockholder in Inland but not in Sheet & Tube. In the Inland-Sheet & Tube negotiations he had advised compromise between Chairman Campbell, of Sheet & Tube company, and L. E. and P. D. Block, of Inland, as they were trying "to drive a hard bargain." Finally, what appeared to be satisfactory terms were arranged. Mr. Eaton had gone to Florida for a vacation, and when he returned to Cleveland he was "astonished" to learn from Mr. Dalton that the Inland proposals were off and was "alarmed" that Bethlehem was proposed as a substitute for Inland in a merger with Sheet & Tube.

Vetoed Merger with Republic

Mr. Campbell previously had refused to talk of a merger with Republic Iron & Steel because of lack of diversity of products, as both then made about the same lines of product, and also because of possible opposition by the federal trade commission.

Earlier in his testimony Mr. Eaton said he first became interested in steel in 1922 when Otis & Co., Cleveland bankers and brokers in which he is a partner, organized a statistical bureau and began to study the industry. Thus in 1923 when the Trumbull company got into financial difficulties they were prepared to step in and offer $18,000,000 with which to rehabilitate the Trumbull properties. Then he became interested in Republic Iron & Steel, later in Inland and Sheet & Tube through stock acquisitions.

Electric Hoist Business Decreases in July

New York—A decrease in electric hoist business in July is reported by the Electric Hoist Manufacturers' association, 165 Broadway. There was a decline of 18.1 per cent in the number of hoists ordered and a falling off of 4.071 per cent in the value of the orders. Shipments were off 18.528 per cent.

Vanadium Earnings Higher

Vanadium Corp and subsidiaries earned $3.30 a share for the six months ending June 30, according to its report for first half. Net income was $1,250,237, compared with $1,177,688, or $3.12 a share for first half of 1929.

World Tariff Debate Brings List of Industrial Rulers

FOUR leaders in the steel industry are included among the 64 industrialists, financiers and business men named by James W. Gerard, former ambassador to Germany, as "the men who rule the United States." The four are Myron C. Taylor, chairman of the finance committee, and James A. Farrell, president of the United States Steel Corp.; Charles M. Schwab, chairman, and Eugene G. Grace, president, Bethlehem Steel Corp.

Mr. Gerard's list is a sort of by-product of the American and European tariff discussions. Since the new tariff was enacted by congress the British and continental newspapers and journals have given many pages to discussions of international trade and the effect of tariff relations. Particularly in France there is strong sentiment for "retaliation" for alleged discrimination in the American duties on French products.

In Great Britain Viscount Rothermere and Lord Beaverbrook are advocating Empire free trade and high protection against the rest of the world. Mr. Gerard wrote a pamphlet published in England endorsing the so-called Beaverbrook plan.

"Give the forty men who rule the United States ten years for the development of this empire and no country could approach it in per capita wealth," he wrote. However, he qualified this assertion with the statement that it would be essential for them to put in effect the Beaverbrook tariff policy.

Asked for the names of the forty who "rule the United States," Mr. Gerard gave out a list containing 59 names, and later added five more. He excluded public officials "because they owe their influence to the offices and they hold and are shorn of their power when they retire."

All this, of course, was an interesting diversion on the topic of the tariff. What is of more immediate concern is the fact that for the first time in the history of Canada 2500 tons of steel for penstocks for a Canadian paper and pulp mill has gone to British producers, instead of to Pittsburgh.

Dominion Bridge Co., Lachine, Que., awarded the contract for the large penstocks for the Powell River Co.'s new pulp and paper mill, has placed the order for 2500 tons of steel with English steel companies. Heretofore, steel penstocks for almost every paper mill in Canada, have been made in Pittsburgh and it is understood this is the first order of the kind placed in Great Britain. The new British preferential tariff rates tend to turn to British producers business that formerly went exclusively to mills in the United States.

Henry P. Fletcher of Pennsylvania, former ambassador to Italy, has been appointed chairman of the United States tariff commission, which will be charged with readjusting inequitable rates in the Hawley-Smoot tariff bill. Thomas Walker Page has been named by President Hoover as a Democratic member of the commission. He was a member of the tariff commission during the administration of President Wilson, part of which time he was chairman.

BUILDING BATTLEDECK FLOORS OF LARGER AREAS

There are approximately 8500 square feet in this battledeck floor in a Pittsfield, Mass., garage. The floor consist of steel plates ¼-inch thick and 24 inches wide, welded to 5-inch I-beams. Haarmann Steel Co., Holyoke, Mass., was the constructor, using General Electric Co.'s automatic welding equipment. The average span is 20 feet, and the safe maximum uniform distributed load is 135 pounds per square foot, the floor itself weighing 15.2 pounds per square foot

Ford To Ship Wabana Ore to British Plant

North American iron ore will go into the production of Ford automobiles in England. Arrangements have been made for shipments of ore 2000 miles from the Wabana deposits on Bell Island, Newfoundland, to the Ford Motor Co.'s new plant in Dagenham, England.

Steamers have been chartered to carry 32,000 tons during October and November, 1931; 80,000 tons from May to November, 1932, and 30,000 tons from May to November, 1933. The ore will be supplied by the Dominion Steel & Coal Corp., through its operating subsidiaries, Dominion Iron & Steel Co., and Nova Scotia Iron & Steel Co. Special equipment is being installed for rapid unloading of the ore at the Ford plant on the Thames.

Shipments of ore in recent years from the Wabana mines have averaged about 1,500,000 tons annually, mainly to the Dominion plants at Sydney, N. S., and to Krupps in Germany.

Republic Adds Capacity At Youngstown Plant

Work on a $1,000,000 expansion program for the open-hearth department at the Youngstown works of the Republic Steel Corp. is to be started shortly, company officials announce.

The work involves the installation of three new 275-ton cranes, among the largest ever placed in use in this country. A large addition to the open-hearth building will be constructed.

The corporation has 15 open hearths at the Youngstown works, all but two of which are of 85-ton capacity. The present expansion will increase the thirteen 85-ton furnaces to 110-ton capacity and provide for their later expansion to 250-ton capacity.

The average monthly capacity of the open-hearth division will be increased from 72,000 tons to 95,000 tons, and the new equipment will result in substantial savings in producing costs.

Manganese Producers and Users Argue Soviet Case

DOMESTIC manganese producers appeared before Seymour Lowman, assistant secretary of the treasury, and his experts in Washington last Friday to back up the charge of the American Manganese Producers' association that there is dumping on the American market of manganese ore from Russia. Another hearing will be held Sept. 9, at which time Thomas J. Doherty, counsel for the American Iron & Steel institute, and representatives of Amtorg Trading Corp. representing Russian producers, will be given an opportunity to be heard.

Those appearing at the hearing Friday included J. Carson Adkerson, president of the manganese association; W. C. Roberts, American Federation of Labor; Harold Pumpelly, secretary of the association and vice president of the Domestic Manganese & Development Co. of Butte, Mont.; E. S. Clark, counsel for the association and connected with the Chapin Exploration Co., Chicago; K. M. Leute, president, General Manganese Corp. of South Dakota; and Charles W. Massey, of the High Grade Manganese Production & Sales Corp. of Virginia.

Others present included Mr. Doherty for the institute, W. H. Johnstone, Bethlehem Steel Corp. and William Mossman, of the Jones & Laughlin Steel Corp.

Says He Has Secret Information

Mr. Adkerson stated that the domestic manganese industry is practically at a standstill because of the imports from Russia. He told Mr. Lowman that he has a great deal of confidential information on the subject of manganese production in Russia which he will file with the department, but which he refused to make public.

"The American manganese industry," said Mr. Adkerson, "is being wrecked by the ruthless dumping program of Soviet Russia, whereby convict or forced labor is being used in the production of manganese and other materials, sold in America without regard to sales price or cost of production.

"Soviet agents in the United States," he continued, "have offered to undersell any American producer of manganese ore, regardless of what price the American or other producer may quote. Such a situation cannot be tolerated by American industry and labor and a firm appeal is being made for the protection of domestic manganese.

"From the information presented to the secretary of the treasury it is precisely charged and clearly indicated that Russian manganese is being dumped on the American market. Therefore, the American Manganese Producers' association asks the secretary of the treasury to withhold the appraiser's report and liquidation of entries of Russian manganese until the amount of additional dumping duty, properly chargeable under the antidumping act of 1921, shall be been ascertained."

Mr. Adkerson, during the course of his testimony, made general statements and drew conclusions which brought forth the request from Mr. Lowman that actual facts be presented. It was at this point that Mr. Adkerson stated that he had confidential information.

Mr. Pumpelly stated that his company had expended in the neighborhood of $300,000 on the plant at Butte after having been encouraged to experiment with manganese ore by various steel companies. The plant, he said, was begun in 1927 and began operations in 1928. To the present, he declared, his company has lost in the neigbborhood of $500,000. The ore produced by his company, has been sold at 60 to 61 cents per unit while it had been anticipated that it would bring from 65 to 68 cents.

"I am ready to produce," said Mr. Pumpelly, "70,000 tons of high-grade ore a year, but I can't sell it. We are in a position to produce more manganese at our plant than was produced in the United States last year."

Asked about the manganese content of the ore of his company he stated that it is around 62 per cent while the Russian is about 50 per cent. No mines are now operating in the United States, he told the secretary, because of the Russian competition. There are six major producers in the country and 25 undeveloped mines, he said.

Mr. Clark said the Chapin company had been ready to establish a new plant but had been kept from doing so by the importations from Russia. He read from an economic review the labor conditions in the Russian manganese mines to the effect that the workers are receiving an average wage of $43 per month.

"Another Fishing Expedition"

A brief statement was also made on behalf of the American Federation of Labor by Mr. Roberts who urged that the domestic industry be given sufficient protection to permit it to continue to function and employ American labor.

A short statement was also made by Mr. Doherty on behalf of the Steel institute in which he characterized the manganese producers case as another "fishing" expedition.

"We are ready to present real facts," said Mr. Doherty, "We will show that Russian manganese prices are substantially the same as those of other producing countries of the world. We will make it a matter of proof. Nothing has been put forward this morning to justify a suspension of tariff liquidations. The slump in the steel industry has made manganese a drug on the market. Steel producers have more now than they know what to do with."

A typical manganese ore mine in Russia, from which country 370,903 tons was exported to the United States in the first six months of this year. It is these imports which the American producers are seeking to check, claiming that the ore produced with cheap labor is dumped in this country

July Exports Lowest Since 1925, Imports Since 1924

DECLINE in the export trade of the United States in ferrous products continued for the fourth consecutive month, to reach in July, 1930, with total shipments of 131,772 gross tons, the lowest figure since February, 1925, the trade for that month having amounted to only 102,299 tons, according to the iron and steel division, department of commerce, Washington. The July figure represents a decrease of 17.3 per cent compared with that for June, 1930, and was 51.5 per cent lower than the July, 1929, trade. On a daily average basis, exports in July, 1930, amounted to 4251 tons; June, 1930, 5313 tons; and July, 1929 8773 tons.

Import trade, with total receipts of 39,700 tons, was the lowest since November, 1924, this figure representing a drop of 18.9 per cent from the June, 1930, figure and 44.5 per cent compared to the July, 1929, total. Daily average imports in July, 1930, amounted to 1281 tons; while in June, 1930, it was 1632 tons; and in July, 1929, it amounted to 2309 tons.

Perhaps the outstanding feature of the trade this month is the drop in the shipments of scrap iron and steel to Japan, sales of scrap to that

IMPORTS AND EXPORTS
Gross Tons

	—1930—		—1929—	
	Imports	Exports	Imports	Exports
Jan.	42,314	225,090	54,793	274,296
Feb.	43,351	197,426	58,146	259,711
Mar.	55,604	238,333	52,747	270,925
April	52,650	208,640	54,337	277,580
May	52,814	196,120	74,272	261,516
June	48,955	159,392	63,635	247,811
July	39,700	131,772	71,378	270,532
Total (7 mos.)	335,388	1,356,773	429,308	1,862,371
Aug.	.....	.....	83,969	242,856
Sept.	.....	.....	60,974	222,408
Oct.	.....	.....	63,226	247,646
Nov.	.....	.....	54,041	241,829
Dec.	.....	.....	47,486	215,242
Total	.....	.....	739,004	3,032,352

ORIGIN OF JULY IMPORTS
Gross Tons

	Ingots	Steel scrap	Cast iron pipe	Steel bars
Austria	.....	.....	.....	11
Belgium	1,899	.....	.....	2,027
Canada	2	1,531	.....	3
Czechoslovakia	.....	.....	.....	17
France	496	.....	4,102	331
Germany	13	.....	632	698
New Zealand	.....	812	.....	.....
Norway	1	.....	.....	.....
Sweden	31	.....	.....	371
United Kingdom	65	.....	.....	32
Total	2,507	2,343	1,734	3,490

IMPORTS OF IRON AND STEEL PRODUCTS
Gross Tons

Item	July 1930	June 1930	July 1929
Pig iron	9,756		
Sponge iron	75	6,794	6,734
Ferromanganese and spiegeleisen*	5,020	7,596	5,413
Ferrochrome†	18	57	142
Ferrosilicon**	187	832	1,079
Other ferroalloys‡	240	.....	.....
Scrap	2,343	2,668	9,101
Steel ingots, blooms, billets, etc.	2,507	1,457	3,519
Iron bars	24	137	127
Steel bars	4,476	2,419	3,209
Wire rods	485	955	1,242
Boiler and other plate	51	407	34
Sheets, skelp and saw plate	254	3,555	2,818
Tin plate	793	38	31
Structural shapes	6,514		
Sheet piling	.....	13,496	18,247
Rails and rail fastenings	436	166	1,067
Cast iron pipe and fittings	1,734	2,313	6,383
Welded pipe	505		
Other pipe	358	2,321	3,192
Barbed wire	388	368	577
Round iron and steel wire	272	428	490
Flat wire and strip steel	52	96	137
Wire rope	179	340	247
Hoops and bands	2,375	1,572	6,770
Nails, tacks	611	716	800
Bolts, nuts and rivets	9	23	29
Castings and forgings	76	159	164
Total	39,700	48,955	71,579

*Manganese content.
†Chromium content.
**Silicon content.
‡Class not shown prior to June 18, 1930.

DESTINATION OF JULY IRON AND STEEL EXPORTS
Galvanized Tin

	steel sheets	terne plate	Black sheets	Steel bars
Argentina	47	891	953	58
Brazil	890	160	57	33
Canada	1,518	7,006	4,273	1,784
Central America	268	1	58	103
Chile	1	487	122	432
China	117	1,187	82	29
Colombia	180	163	67	27
Cuba	252	204	74	153
Dutch East Indies	690	.....	124	.....
Finland	48	.....	.....	.....
France	.....	.....	2	.....
Italy	.....	642	304	.....
Japan	198	2,026	241	1
Java	92	.....	1	.....
Mexico	761	1,106	235	44
Norway	29	.....	.....	.....
Panama	57	.....	50	578
Philippines	1,637	904	.....	192
Peru	129	604	25	87
Soviet Russia	13	.....	.....	.....
United Kingdom	.....	129	191	670
Uruguay	150	261	80	287
Venezuela	149	6	2	8
Total	7,325	17,921	7,038	4,684

EXPORTS OF IRON AND STEEL PRODUCTS
Gross Tons

Item	July 1930	June 1930	July 1929
Pig iron, not including ferroalloys	453	1,000	7,777
Ferromanganese and spiegeleisen	216	1,163	40
Scrap	14,731	35,808	49,358
Ingots, blooms, etc.	317	1,675	1,236
Iron bars	122	112	167
Steel bars	4,684	7,245	17,183
Alloy steel bars	145	475	546
Wire rods	2,266	4,479	5,823
Plates	7,874	6,276	19,675
Skelp	9,698	7,239	13,976
Iron sheets, galvanized*	555	549	.....
Steel sheets, galvanized*	7,325	7,068	14,148
Sheel sheets, black	7,038	6,862	18,259
Iron sheets, black	1,097	843	1,428
Hoops, bands and strip steel	2,186	3,249	4,871
Tin plate, terne plate, etc.	17,921	15,577	16,875
Structural shapes, not fabricated	11,932	10,229	29,002
Structural shapes, fabricated	6,494	8,573	10,266
Tanks, complete and knocked down†	1,605	855	.....
Metal lath	412	338	544
Steel rails	8,413	7,750	9,999
Rail fastenings, switches, frogs, etc.	1,472	2,031	3,102
Boiler tubes	765	936	1,770
Casing and oil line pipe	3,237	3,314	6,447
Malleable-iron screwed pipe fittings	680	680	1,070
Cast-iron screwed pipe fittings	435	392	1,704
Cast-iron pressure pipe fittings	1,434	1,001	1,016
Cast-iron soil pipe and fittings	717	1,632	1,132
Black and galvanized welded wrought-iron pipe*	934	1,036	.....
Black and galvanized welded pipe*	5,743	7,350	14,880
Plain wire	1,815	1,877	3,591
Barbed wire and woven wire fencing	3,552	4,790	5,695
Woven wire screen cloth	161	144	125
Wire rope	294	450	736
Insulated wire and cable, iron and steel	23	17	56
Other wire and manufactures	640	624	1,258
Wire nails	844	625	962
Nails, other than wire	402	437	1,352
Tacks	31	47	71
Bolts, nuts, rivets, etc., except railway	821	783	1,232
Iron castings	356	753	901
Steel castings	729	769	966
Car wheels and axles	382	1,653	1,645
Horseshoes	8	8	37
Forgings	813	678	1,039
Total	131,772	159,392	271,960

*Combined prior to 1930.
†Included in a miscellaneous classification prior to 1930.

market during the month having amounted to only about a quarter of their usual volume.

Of the five major geographic divisions to which American iron and steel products were exported in July, North and Central America, the West Indies and South America showed a larger tonnage in July than in June, the totals for the Far East and Europe decreasing enough to more than cover the total drop shown. Of the 131,772 tons exported in July 58.3 per cent went to North and Central America and the West Indies, 48.7 per cent going to these destinations during the elapsed seven months of 1930.

ORIGIN OF JULY IRON AND STEEL IMPORTS
Gross Tons

	Iron ore	Pig iron	Manganese	Ferro-manganese
Algeria and Tunis	22,300	.....	.....	.....
Australia	47,656	.....	.....	.....
Brazil	.....	.....	6,956	.....
British India	.....	8,238	4,160	.....
Canada	83	.....	34	1,284
Chile	151,211	.....	.....	.....
Gold Coast	.....	.....	2,701	.....
Italy	.....	.....	.....	124
Netherlands	.....	350	.....	.....
Norway	.....	668	.....	1,566
Soviet Russia in Europe	.....	.....	2,080	.....
Sweden	29,740	200	.....	.....
United Kingdom	45	300	13	2,046
Totals	251,035	9,756	15,944	5,020

DESTINATION OF IRON AND STEEL EXPORTS
Gross Tons

Country	July 1930	June 1930	July 1929
North and Central America and West Indies	76,766	75,622	142,244
Canada and Newfoundland	60,994	60,416	118,194
Cuba	3,436	3,897	5,698
Guatemala	567	349	949
Honduras	592	618	495
Mexico	7,026	7,145	11,906
Panama	2,001	1,043	780
Salvador	98	109	462
British West Indies	890	1,334	700
Other West Indies	886	425	2,062
Other Central America	276	286	998
South America	20,739	18,202	28,725
Argentina	5,404	3,663	6,421
Brazil	5,011	3,971	6,739
Chile	3,300	5,466	5,098
Colombia	1,530	1,216	2,725
Peru	1,534	902	3,076
Uruguay	1,920	1,695	381
Venezuela	1,774	1,095	4,024
Other South America	266	194	261
Europe	6,957	14,075	39,238
France	102	446	3,636
Germany	49	71	5,011
Italy	970	2,807	12,673
Poland and Danzig	7	.....	6,634
Soviet Russia in Europe	236	908	131
Spain	7	405	2,367
Sweden	189	237	337
United Kingdom	2,910	4,500	6,005
Other Europe	2,487	4,701	2,444
Far East	25,946	50,122	59,518
British Malaya	172	447	382
China	2,091	2,908	4,878
Netherland East Indies	3,238	1,950	7,452
India and Ceylon	571	236	382
Hong Kong	1,375	129	220
Japan	11,269	36,909	31,330
Kwantung	318	87	617
Philippine Isl.	5,338	6,488	11,302
Australia	1,002	483	2,108
New Zealand	213	268	142
Other Asia and far east markets	359	217	705
Africa	1,364	1,371	2,235
Union of South Africa	73	513	1,168
Egypt	953	116	585
Mozambique	76	78	328
Other Africa	262	664	154

Pittsburgh River Traffic Grows; Auto Output Down

River traffic in iron and steel products in the Pittsburgh district set a new record for July. The 1930 figures for seven months exceed the total for twelve months for any year prior to 1928. Comparative monthly figures follow:

	Allegheny	Monongahela	Ohio
1929			
July	25	109,051	102,963
(7 mos.)	1,507	670,002	639,990
August	100	134,426	137,734
Sept.	.....	135,773	150,163
Oct.	.....	119,380	119,129
Nov.	500	83,189	88,011
Dec.	400	60,957	77,885
Total	2,507	1,203,827	1,212,912
1930			
Jan.	100	58,784	64,736
Feb.	210	80,327	74,385
March	100	111,702	109,911
April	1,000	70,229	66,482
May	.....	117,942	128,502
June	700	137,603	144,099
July	1,125	132,161	147,558
(7 mos.)	3,235	708,748	735,673

Auto Decline Is Less

July production of motor vehicles in the United States, as reported to the department of commerce, declined for the third successive month, though the rate of decline was smaller than in June. Compared with production in July, 1929, the rate for July this year was 52.8 per cent. Comparisons are as follows:

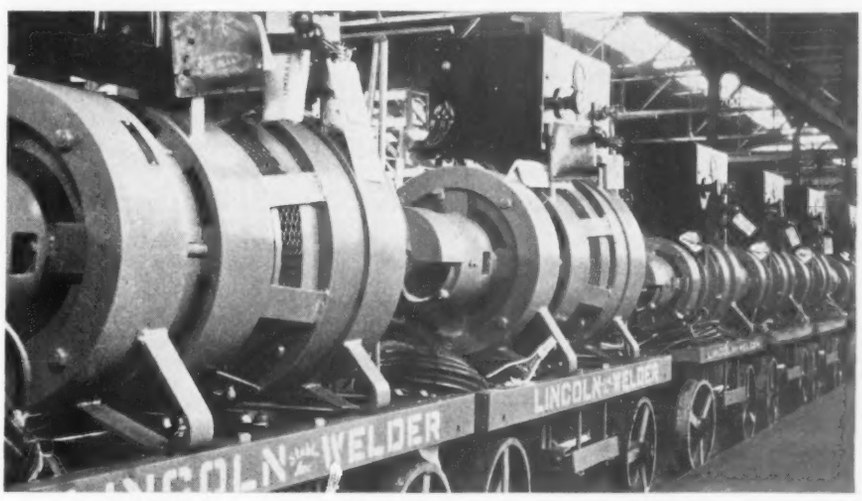
	United States		
1929	Total	Passenger cars	Trucks
July	500,840	424,944	74,842
(7 mos.)	3,726,283	3,188,241	526,355
Aug.	498,628	440,780	56,808
Sept.	415,120	363,471	51,576
Oct.	380,017	318,462	60,687
Nov.	217,573	167,846	48,081
Dec.	120,007	91,011	27,513
(Year)	5,358,420	4,569,811	771,020
1930			
Jan.	275,374	236,145	38,657
Feb.	346,940	296,461	49,457
March	401,313	335,720	64,204
April	443,038	374,913	67,560
May	417,406	362,522	54,370
June	*335,477	289,245	45,773
July	262,363	222,459	39,663
(7 mos.)	2,481,911	2,117,465	359,684

*Revised.

Foundry Equipment Slumps

After one month of recovery from the steady decline of earlier months the monthly index for foundry equipment for July dropped back to the

(*Concluded on Page* 33)



MODERN EQUIPMENT MADE BY MODERN METHODS

Considerable has been heard of straight line production in the automotive field. The same principle is applied in many other industries. Here, for example, is the assembly and final inspection line of arc welders in the plant of the Lincoln Electric Co., Cleveland

Industrial Men in the Day's News

Dr. Sigrid Specht, Vice President and Chief Engineer, Ferrous Magnetic Corp.

Photo by Blank-Stoller Inc.

PIONEERING in the magnetic testing of steel, he was one of the first designers of nondestructive testing equipment for strip steel.

DESCENDED from a family of engineers in Germany, he has added to this preparation many years of study in technical schools in Europe and America.

SINCE 1923 he has been actively identified in turn with Federated Engineers Development Co., Magnetic Analysis Corp., and Ferrous Magnetic Corp.

ASSOCIATES of Dr. Sigfrid Specht assert he has a feeling for magnetism which virtually constitutes a sixth sense. Whether that is true, he is a pioneer in magnetic testing of steel and designer of the first commercial machine for continuous nondestructive testing of steel strip. Formerly associated with Magnetic Analysis Corp., Brooklyn, N. Y., he recently resigned to become vice president and chief engineer of Ferrous Magnetic Corp., New York.

Born in Elberfeld, Germany, of a family of engineers, he received his early technical training in a preparatory school there but later attended the Institute of Technology in Berlin. He specialized in physics, engineering and chemistry and upon graduation entered the organization of Specht Electrification Co., Elberfeld, operated by his uncles. After three years as physicist and engineer, he became engineer for the Koll Steel Works, Remscheid, Germany, manufacturer of special strip and sheet steel. This connection definitely turned his attention toward the steel industry and while there he first realized the need for a nondestructive method of testing steel. To establish a better background for metallurgical research he left the Koll Steel Works after about two years to enter Polytechnic institute, Paris, to study alloys and higher mathematics. He next studied metallurgy at Trinity school, Dublin, Ireland, and then located in the United States, becoming research engineer and technical advisor in the law firm of Emory, Booth, Janney & Varney in connection with lawsuits resulting from confiscation of German interests in this country during the war. While stationed at Pittsburgh, he took several courses at Carnegie Institute of Technology.

In 1923 Dr. Specht joined the Federated Engineers Development Corp. of New York, where he came in contact with magnetic analysis work done by Dr. Charles W. Burrows, who died in 1925. In 1924 when the company's magnetic analysis business was absorbed by the Magnetic Analysis Corp., Brooklyn, Dr. Specht became its chief engineer and later when the Ferrous Magnetic Corp. was formed, John Hoffhine, formerly president of the Magnetic Analysis Corp., became president and Dr. Specht vice president and engineer.

S. R. ROBINSON, formerly foundry manager, Industrial Brownhoist Corp., Bay City, Mich., has been appointed metallurgical engineer, Ohio Steel Foundry Co., Springfield, O. The steel foundry of the Industrial Brownhoist Corp., was recently purchased by the Ohio Steel Foundry Co.

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George A. Morison, vice president and treasurer, Bucyrus-Erie Co., South Milwaukee, Wis., has resigned the latter office. He remains as vice president in charge of finance, commercial and corporation matters and will assume those duties actively upon his return from a vacation in Europe.

John G. Miller, formerly manager of domestic sales has been elected treasurer, effective Oct. 1, and P. H. Birckhead, formerly assistant is now manager of domestic sales.

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Edward P. Scallon, formerly of Hancock, Mich., who for the past ten years has been general superintendent of Lake Superior iron ore mines for Clement K. Quin & Co., Cleveland, has resigned to engage in a private engineering practice. Prior to joining the Quin organization in 1919 Mr. Scallon was general superintendent of the United Verde Extension, Jerome, Ariz.

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C. W. Frillman has been appointed manager in charge of sales, Apex Machine Co., Dayton, O., manufacturer of safety friction tapping chucks, quick change chucks, universal joints, etc. Mr. Frillman has had several years experience in the manufacture and sale of tools.

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R. A. Olsen has severed his connection with the Tuthill Spring Co., Chicago, with which he has been identi-

fied for 14 years, the last six as sales manager.

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F. A. Rumbarger has been appointed Pittsburgh representative of Browning Crane Co., Cleveland.

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Frank D. Carney, consulting metallurgist, 27 Pine street, New York, is on a trip to Europe to return in October.

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E. G. Howell, vice president Erman Howell Co., Chicago, iron and steel brokers, was seriously injured Aug. 20 when his automobile was struck by a train at Winnetka, Ill.

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James H. Kennedy, for several years assistant superintendent, Mystic Iron Works, Everett, Mass., has resigned and after Sept. 1 will be associated with L. J. Buck & Co., New York.

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F. A. Werner, chief chemist, Joliet, Ill., works, Illinois Steel Co., Chicago,

I. Lamont Hughes

has been transferred to the New York office of the United States Steel Corp. Ernest Johnson has been appointed to succeed him at Joliet.

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Joseph P. Taylor has retired after a connection with the Midvale Co., Philadelphia, dating back to 1898, in recent years as consultant in machine shop practice. He was graduated from Worcester Polytechnic institute in 1891 and spent several years in the shops of the Michigan Central railroad.

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C. A. Portman was recently appointed general manager, Illinois Iron & Bolt Co., Carpentersville, Ill. For some time he was associated in an executive capacity with American Can Co. and more recently was general manager for ten years with Oliver Plow Co., South Bend, Ind.

Clyde Resigns as Carnegie Head; Hughes His Successor

WILLIAM G. CLYDE, president of Carnegie Steel Co., Pittsburgh, has resigned, effective Sept. 1, on account of ill health. He is succeeded by I. Lamont Hughes, who has been vice president in charge of operations for the United States Steel Corp., New York, since April, 1928.

Mr. Clyde has been president of the Carnegie Steel Co. since Oct. 31, 1925, after having occupied the positions of assistant general manager of sales, general manager of sales, vice president and general manager of sales and general supervisor of all warehouses.

Ambrose N. Diehl, vice president, Carnegie Steel Co., resigned to become a vice president of the United States Steel Corp., and Ralph H. Watson, general superintendent, Homestead works, Carnegie company, has been named to succeed him.

Sydney Dillon, chief mechanical engineer, Carnegie Steel Co., has been named assistant to Mr. Watson, vice president, and R. A. Holcomb continues as secretary to the president, Mr. Hughes.

Mr. Hughes has been with the Carnegie company or its allied interests for more than a quarter century. From 1897 until 1901 he was in the engineering department, Edgar Thomson works, but in June of the latter year he was placed in charge of the engineering department, Union Steel Co., Donora, Pa. In January, 1905, he was made master mechanic of the Carnegie company bar mills of the Youngstown, O., district, and in March, 1906, he was appointed assistant superintendent of that group. Five years later he was promoted to be general superintendent of those mills, continuing in that capacity until Jan. 1, 1916, when he was made assistant general superintendent of the entire Youngstown district operations of the company, which included the construction of steel bar mills and the townsite at McDonald, O. In June, 1916, Mr. Hughes went to Ojibway, Ont., as general superintendent in charge of the Canadian Steel Co.'s project there, but because operations were deferred by the war, he was transferred in June, 1918, to be general superintendent of ordnance plant operations carried on at Neville Island near Pittsburgh by the United States Steel Corp. for the United States government. At the close of the war, Mr. Hughes was made president of Lorain Steel Co., Johnstown, Pa., remaining from May 1, 1918, until Jan. 1, 1920, when he was made general superintendent of all Carnegie operations in the Youngstown district. In January, 1925, he was made a vice president of the Carnegie company and in April, 1928, a vice president of the Steel corporation in charge of operations, and assistant to James A. Farrel, president.

Mr. Diehl, who succeeds Mr. Hughes as vice president of the Steel corporation, has been with the Carnegie company since 1899, when he was employed in its laboratories at Duquesne works. After seven months he was transferred to the blast furnace department, where after six months he was made blast furnace superintend-

William G. Clyde

ent. He was given charge in October, 1901, and remained until 1915, when he was made assistant general superintendent of Duquesne steel works and blast furnaces. After 18 months he was appointed assistant operating vice president in the general offices in Pittsburgh, serving in that capacity another 18-month period. He was given general charge of Dusquesne works as general superintendent in 1918 and was made vice president of the Carnegie company in January, 1925.

Mr. Watson, new vice president of Carnegie company, became metallurgist's assistant at its Homestead steel works in March, 1902. He successively became metallurgist, second assistant general superintendent, superintendent of open-hearth furnaces, assistant general superintendent, and in April, 1928, was made general superintendent to succeed John S. Oursler.

Protested Southwestern Pipe Rates May Be Lowered

FREIGHT rates on shipments of wrought iron, steel and cast iron pipe and related articles to the Southwest will be revised if the interstate commerce commission approves the recommendations given at Washington by Attorney Examiner R. G. Taylor.

In brief, this recommendation is that the rate of 32½ per cent of the southwestern first class rate, which was to have been instituted July 14, 1928, but which was suspended at that time and since has been the subject of protest by producers and southwestern consumers, be reduced to 28½ per cent of the first class rate. It was estimated that had the 32½ per cent rate gone into effect it would have meant an increase of from $2,000,000 to $3,000,000 annually in freight charges on southwestern pipe shipments. The recommended rate of 28½ per cent, while resulting in both increases and reductions, will keep about the present average of freight charges which are not based upon the first class rates.

The reduction from 32½ per cent to 28½ per cent will give Pittsburgh a differential of 4½ cents per 100 pounds over Lorain, compared with the 6 cents differential under the original rate of 32½ per cent of the first class rates. Youngstown producers will be unaffected, continuing a differential of 1½ cents over Lorain, the same as formerly. Milwaukee also will have a differential of 1½ cents over Chicago.

Final decision on the part of the interstate commerce commission is not expected to be made until early in 1931. The examiner also recommended that the maximum rates on shipments of cast iron pipe from southeastern origins to the Kansas-Missouri territory be based on a scale of 28½ per cent of the Kansas-Missouri first class rates. Differentials are to be applied on shipments from southeastern origins to destinations in Kansas west of the Kansas-Missouri territory.

Other Southwestern Rates Found Not Justified

Washington—Proposed fifth class rates on iron or steel chains, in carloads, in interstate traffic to and between points in the Southwest and Kansas-Missouri territory have not been found justified by the interstate commerce commission. Column 35 rates, minimum 36,000 pounds, were found reasonable for application thereto, in straight carloads or in mixed carloads with other iron or steel articles.

In the same investigation the commission found that the proposed fifth class rates on barrel or drum material to and from the same destinations, in carloads, were not justified. Column 35 rates, minimum 40,000 pounds, were found reasonable for application thereto.

Latest Census Estimate of Unemployed 2,527,482

Estimates based on census returns from 28 states indicate the number of unemployed April 1 in the entire country was 2,527,482, out of a total of 122,698,290. The percentage of unemployment in the 28 states averages 2.06, and this factor is used in arriving at the general estimate. The figures for all the states have not yet been compiled. Unemployment in Michigan was found to be 160,506 or 3.3 per cent of the population of that state; in New Jersey 126,615, or 3.2 per cent; Pennsylvania 211,877, or 2.2 per cent; Indiana 66,300, or 2.1 per cent. Unemployment figures for New York, Ohio, Illinois and some other important industrial states have not been compiled.

Employe Stock Plans Show Renewed Strength

Employe stock subscriptions plans did not suffer any setback as a result of the stock market crisis of 1929, but emerged from that severe test strengthened by increased confidence on the part of employes.

This is the conclusion of the National Industrial Conference board, following a systematic check-up. In 1927, it was found that 315 such plans were maintained by American industrial concerns. As tangible evidence that the above conclusion is correct, the board cites many instances of new offerings of stock to employes since the market crash, which have met with a ready response, in some cases resulting in a heavy oversubscription of the issue.

An important element of strength in these plans was the fact that in many instances stock had been sold to employes substantially below the market price, or that the price had been set before the final rapid rise in stock prices which preceded the crash.

Communists Prepare for Rallies at Shop Gates

Labor day, Sept. 1, has been designated as "National unemployment day" by the Communist party in the United States. The communists are concentrating their efforts to win members with a platform calling for "social insurance to all workers unemployed, or unable to work because of sickness, injury, maternity or old age." Communist "directives" have instructed local committees to: "Intensify activities in and around the shops. Special meetings of all shop committees and nuclei shall be called. Stress and emphasize the necessity of recruiting new members into the shop committees as a result of this work."

Obituaries

THOMAS GRAY BENNETT, 80, for 21 years president, Winchester Repeating Arms Co., died Aug. 19 at New Haven, Conn. He was a native of New Haven and a graduate in 1870 from Sheffield Scientific school, Yale university. After graduating he entered the employ of the Winchester company, becoming secretary, treasurer and vice president. He was president from 1890 to 1911 when he resigned, but continued as consulting director.

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Frank Blacketer, formerly operator of the Long Beach Brass Foundry, Long Beach, Calif., died recently at his home in Santa Ana, Calif.

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Walter S. Bickley, 63, formerly president, Penn Steel Casting Co., Chester, Pa., died July 23 at his home in Swarthmore, Pa., following a 2-year illness.

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T. C. Uran, one of the founders of the Solid Steel Co., the predecessor of the American Steel Foundries, Alliance, O., and latterly a prominent banker of that city died recently there.

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Fred Dias, formerly connected with the Western Stove Co., Culver City, Calif., and more recently with the Advance Bronze & Aluminum Foundry, Los Angeles, died recently at Oakland, Calif.

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Charles L. Patterson, 74, retired vice president and director, E. I. du Pont de Nemours & Co., died Aug. 19 at his home, Wilmington, Del. Mr. Patterson was born at Pottsville, Pa., and early in his career served as an engineer with the Reading Coal & Iron Co., the Lehigh Valley Coal Co. and Lehigh Valley railroad.

Here and There in Industry

JARVIS FLINT ERECTION CO., Flint, Mich., has been organized to merge the erection departments of the Flint Structural Steel Co. and the Jarvis Engineering Works, both of Flint. This company is owned by the Flint Structural Steel Co., a half interest, and E. C. Jarvis and E. R. Dail, the remaining half. A substantial interest in the latter company has been bought by Messrs. Jarvis and Dail, the latter being elected president, with E. H. Perkins, formerly vice president, as secretary, treasurer and general manager. Mr. Dail will continue in charge of the Jarvis Engineering Works, of which he has been general manager for 15 years.

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Mabry-Green Foundry & Machine Co., Beaumont, Tex., has changed its name to Mabry Foundry & Machine Co.

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Dominion Foundries & Steel Ltd., Hamilton, Ont., is planning additions to its blooming mills to cost about $300,000. C. W. Sherman is president.

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Shaw Sales Co., Tulsa, Okla., has been organized by E. A. Shaw, formerly secretary-treasurer of the Peerless Supply Co., to handle oil field and industrial specialties.

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Flexlume Corp., Buffalo, N. Y., manufacturer of electric signs, has acquired the Louisiana Neon Co., New Orleans, and announces that it will build a $100,000 plant there.

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Louis Allis Co., Milwaukee, manufacturer of electric motors, has opened a southwestern sales office at Tulsa, Okla., in charge of W. Woobank, at 215-B East Archer street.

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Stupp Bros. Bridge & Iron Co., St. Louis, has consolidated its contracting office, formerly in the Syndicate Trust building, with its general office and plant at 3700 Weber road.

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Torrington Co., Torrington, Conn., has re-elected W. R. Reid president. E. A. Carter Springfield, Mass. and Joseph Remick, Boston were elected directors.

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Freyn Engineering Co., Chicago, has sent its second group of engineers to Russia in connection with its contract for a complete steel plant at Kuznetsk, Siberia. The party includes: Mr. and Mrs. E. P. Everhard and children; Mr. and Mrs. E. H. Koenig; Mr. and Mrs. G. P. Wilson; Mr. C. A. Fox; Mr. Lewis Galloway; Mr. C. E. Maeder; Mr. C. B. Bower; Mr. A. L. Collette; Mr. and Mrs. J. A. Durfee; Mr. O. R. Rice; Mr. L. A. Wales; and Mr. L. T. Youhn.

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Mount Vernon Furnace & Mfg. Co., Mount Vernon, Ill., has purchased the plant of the Universal Stove Co. Inc., St. Louis, and is moving the plant to Mount Vernon. The St. Louis company was incorporated in 1915.

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Reliance Electric & Engineering Co., Cleveland, manufacturer of electric motors, has moved its Boston office from 80 Federal street to 89 Broad street. R. H. Smith continues as district manager.

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Driver-Harris Co., Harrison, N. J., has been granted a melting license by the Krupp-Nirosta Co., Watervliet, N. Y., for production of Krupp Nirosta steel in castings, rods, sheets, strip and wire.

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Kinney Iron Works, Los Angeles, Wendell H. Kinney president, has moved to its new plant at 2525 East Forty-ninth street, which gives greatly enlarged facilities. The company produces gray iron and semisteel castings.

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Allbright-Neil Co., 5315 South Western avenue, Chicago, has purchased the patents, patterns and good-will of the Mechanical Mfg. Co., Chicago, a subsidiary of Swift & Co., for about $2,000,000. The Mechanical Mfg. Co. produces packing house machinery and equipment and has its plants located at the Union Stock yards, Chicago.

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Carborundum Co., Niagara Falls, N. Y., has bought the abrasive division of the American Glue Co., Boston, which will be known as the Union Sand Paper division of the Carborundum Co. Manufacturing operations will be continued at East Walpole, Mass., and Brantford, Ont. The main office will be at 121 Beverley street, Boston.

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Wrought Washer Mfg. Co., 46 South Bay street, Milwaukee, plans to proceed shortly with its new plant at Oklahoma avenue and the Milwaukee road main line tracks at the southern limits of Milwaukee. An existing building is now being remodeled into a shop with about 40,000 square feet. In addition, plans are in process for a new rolling mill, 65 x 500 feet, a storage building, 65 x 385 feet, and an administration building. The work is in charge of the Klug & Smith Co., 68 East Wisconsin avenue, consulting engineer. Fred Doepke is president.

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Chicago Rapid Transit Co. is adding a second unit, 200 x 252 feet, to its car repair and remodeling shops in Niles Center, Ill., to cost $375,000. The entire car shop project calls for ten units so that 4500 cars a year can be handled. About 1200 of the company's cars are to be remodeled soon.

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Stover Mfg. & Engine Co., Freeport, Ill., has taken over the Swartz Mfg. Co. Inc., also of that place, manufacturer of automotive engine pistons. Officials of the Swartz company are in charge of the automotive division of the Stover Mfg. & Engine Co. R. M. Bennethum is president of the Stover company.

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American Locomotive Co., New York, which has been awarded a contract for supplying twenty-one 72-inch bronze riser valves and nine 48-inch bronze riser valves for the New York board of water supply, has sublet the casting work. The bronze castings will be produced by the William H. Cramp & Sons Ship & Engine Building Co., Beach and Ball streets, Philadelphia; American Manganese Bronze Co., Holmesburg, Philadelphia; Pennsylvania Bronze & Brass Co., Twenty-second and Master streets, Philadelphia; and William H. Barr Inc., 27 Caroline street, Buffalo. There are 526 tons of bronze castings and forgings. The 164 tons of steel castings involved will be produced by the General Steel Castings Co., Eddystone, Pa.

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International Nutyp Tool Corp., Oswego, N. Y., has been formed to take over the business of the former Oswego Tool Co. and complete change in management has become effective. H. W. Stone, formerly president of the U. S. Hoffman Machinery Corp., New York, has been made president and general manager; E. B. Russell, formerly sales manager for Peerless Mills Inc. and head of Security Finance Co., has been made vice president and treasurer; E. W. Fulton, for several years general manager of the Oswego Tool Co., has been made vice president and works manager. A new system of merchandising will be put in effect and new tools will be added to the line. Expansion of the plant is under consideration.

High-speed steel first was exhibited publicly at the 1900 Paris exposition.

MIRRORS of MOTORDOM

AUTOMOBILE makers are still on their hands and knees—moving forward, it is true, but the movement is a slow one. Expectancies of the early month have not come and automobile circles are disappointed. With Ford daily production curtailed slightly, Chevrolet in midstream changing from the old to the new model and Buick with its dealers pretty well stocked by now, early August hopes for a bigger production parade led by these three are dimmer.

Hardly was the prediction made that automobile price cuts must come than a wave of reductions, largely in the lower priced field, swept over the market. Developments have been overshadowed by the price cuts and it is problematical if they will have any effect on buying.

It is true to say there is better sentiment in many quarters and conditions generally continue healthy with low inventories and good cash positions in most of the auto makers. Yet optimists are few. More significant is the fact that more people heretofore committed in their comments for at most two weeks hence have become so pessimistically inclined as to express themselves that 1930 is a write-off and no improvement will be seen until after the first of the year. Vacations were thought to be generally over, but restricted production and part-time shutdown have taken the stage in many cases.

Rumor Predicts Sweeping Changes in Reo Models

Reo, with its impending announcement gives rise to some speculation. Rumor runs that Reo, with its two new 8-cylinder models shortly to come before the public, is incorporating sweeping changes in its car. The body, by Murray, in Detroit, will have a streamline effect, and the new eights will probably be more expensive than the former Reo model.

Ventured remarks that Reo under the reins of W. R. Wilson, its present general manager, is building to group itself, or affiliate with a larger automotive circle, or in itself building as a nucleus, seem not improbable. The fact that Wilson of promotional and financial characteristics formerly with Dodge Bros. and Murray Corp., is in control points to greatly stimulated operations, and this statement seems borne out by Mr. Wilson's recent statements.

Ford has been running four days weekly, though his daily rate no doubt hovers under 7000. There seems to be no truth in the rumor that he will cut operations to three days weekly. Rather September, according to a good report, is tentatively lined up for the 5-day week again.

Ford To Speed Production; Has Large Stocks on Hand

Ford has accumulated large stocks of materials and his open hearths and rolling mills are reported to be closing down shortly for a 2-week period. Contrary to the action of others, Fords are not expected to be cut in price.

Some say that the coming Model A Ford will have its maximum speed materially reduced. The power of the car, coupled with its relatively light frame and body, are hardly in keeping with the power its motor can generate. A change in transmission and a new carburetor are also listed among possible Ford changes.

Henry Ford predicts a 10-month working year in the automobile industry, saying, "The problem challenging us now is how to control industry so that workmen may have steady employment. What it will come to in the motor car industry, it seems to me, is a 10-month industrial year." Mr. Ford adds, "The summer months are not good months to be working in a factory. People need change." The question prompts itself, does Mr. Ford couple his remarks with promises of unemployment insurance?

Total production of Fords, cars and trucks, in 1929 was 1,709,945 units. If we are to have the 10-month year, roughly 5/6 of this figure, as an example, would have been produced. Likewise, if Mr. Ford's idea is taken up by other automotive makers, a material reduction is evident from the 5,358,420 cars that were turned out nationally last year.

Chevrolet Swings Away from Lower Price Field

Chevrolet is on the fence, cleaning up an old job and preparing for a new one. The plant is working five days a week and generally cutting releases to the bone. It released 19,000 bodies from the Fisher plant during the first two weeks of August and has specified on 20,000 bodies for the new 1931 job.

The Chevrolet forge division will be closed down the first two weeks of September, and its axle, gear and spring units from Sept. 15 to Oct. 1, in keeping with the clean-up of old cars and preparation of the 1931 models.

Chevrolet has shown its intention to get further and further away from Ford's low price field. Its 1931 model will be, among other things, 2 inches longer in wheel base, and rumors that Chevrolet will return to the 4-cylinder field, continuing the manufacture of its six, are probably unfounded.

It appears that Chevrolet, despite its intentional competition with Ford in the latter's field, is drifting further into the field of cars away from this competition.

Hudson-Essex has a new model

coming. Its plant at Detroit, continuing quiet, is undoubtedly cleaning up on present models.

The new Hudson body, tested out by Murray Body Corp., will present a striking and pleasing appearance radically different from the present unit. The motor will probably be in a larger bore to give more power for the new eight model.

Some repeat that Hudson-Essex will put its 8-cylinder motor into its small car, though the company's reputation as a clever seller points to the coming of a radically different body type.

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Price cuts which have swept over the low-price field have reduced selling prices to new lows. Hudson-Essex reduction marks the lowest price at which these cars have ever been offered. Oakland-Pontiac has also announced a price slash, placing its 8-cylinder model well under $1000.

Price cuts may be temporary moves to meet individual situations, but they indicate that retail buying has been disappointing.

Again it is true that slower moving lines have been using reductions to keep their product moving and maintain low unsold stocks. Another reason is apparent, that the clearance sale plan is replacing the former practice of allowing retail dealers allowances on models that have to be moved.

Cuts probably won't have any effect on buying. Rather are they looked for to have effect on clearing cars and therefore will be only temporary.

Price cuts from the auto people look like a reversal of form compared with the market in finished steel lines in Detroit. Steel prices, at a low point now, may feel the impetus automobile price cuts can afford, if a change from the present buyers' market can be deduced from the auto price slashes.

Cadillac Eight To Go? LaSalle Plans New Features

Will General Motors have anything new at the January shows? Cadillac-LaSalle division has shown recent sales activity and announcement for the new 1931 models is set for Sept. 6. From the way Detroit figures, the Cadillac eight is to go, its engine going to the new LaSalle model. Bodies of the latter will be better, though the complete price will run cheaper. Some say the new LaSalle eight may incorporate many of the features of the Cadillac V 16-cylinder car.

Chevrolet, as has been noted, will probably entrench deeper in its own field. Oakland-Pontiac is due for a new model, but they have announced their 1931 models will remain practically unchanged in appearance, size and design. The four new Buick straight eights represent an outstanding change General Motors has made this year. And Oldsmobile will be without its Viking by the time the new year rolls around.

Buick Presents Only New Model in July

Did Buick introduce its new model at the correct time? Buick, alone in its new model inception in the exceedingly dull month July was, has by this time stocked its dealers. The early August rate of about 900 daily has been cut to about 700 at present, indicating dealers have their stocks and perhaps showing that early sales are not going as fast as they could. Of course, this is in line with general slow buying in the entire field, and it may be yet early to predict the way Buick will take.

The old Buick six engines are going into General Motors Corp. trucks. Equipment and tools are now installed in the Rapid street plant of the latter company.

Chrysler is quiet on releases. Dodge is at practically a standstill and some exaggerated statements say that they await a car sale before production. Dodge unit has quite large material stocks on hand. Chrysler has cut wages 10 per cent, following on the similar reduction they effected early in July.

A minor change in the new Chrysler is said to be replacement of the current diaphragm fuel pump with a gear-type gas pump.

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Bantam cars are again coming to the fore. Durant Motors reports a contract to build 100,000 small cars similar to the Austin under a patent of the Mathis makers, of France. The contract stipulates deliveries from the Durant Motors' Lansing plant by Dec. 1.

Detroit views skeptically the new Austin and generally discounts the optimistic statements on large numbers of unfilled orders from the American Austin, Butler, Pa., plant.

Vacations were thought to be generally at an end but makers are finding further restriction necessary.

Oakland-Pontiac, recently completed with a further reduction in working force in several departments, is on its second vacation this year and will be down until Sept. 2. Body plants find curtailments necessary and among others Fisher Body at Lansing is off until the second of September; Briggs Body works only three weeks a month.

Hupp was closed the first two weeks of August; White Motor is on a two-week vacation now; Oldsmobile, as Hupp, began after lay-off for the first two weeks of the month.

Foundry Equipment Slumps

(*Concluded from Page 27*)

lowest point of the year. At 90.6 for July the index is at its lowest point since September, 1927. The three-month average of gross orders fell from 166.7 in June to 139.1 in July. index of shipments from 160.5 in June to 116.1 in July and unfilled orders from 166.7 in June to 139.1 in July. Comparisons follow:

	1927	1928	1929	1930
Jan.	180.4	132.7	180.5	160.1
Feb.	198.0	123.6	197.0	196.4
Mar.	131.1	138.6	209.4	164.1
Apr.	130.0	107.7	172.6	122.8
May	134.8	335.6	177.7	92.7
June	138.4	149.1	177.3	102.1
July	89.9	94.8	219.3	90.6
Aug.	106.4	278.0	229.5	.....
Sept.	80.4	170.0	216.3	.....
Oct.	98.0	185.0	245.3	.....
Nov.	95.8	197.8	128.6	.....
Dec.	106.8	166.5	208.0	.....

Base: Average monthly shipments for 1922-23-24 taken as 100.

Malleable Castings Drop

Malleable castings production in July fell off sharply from preceding months, according to compilations of the department of commerce. Comparisons are as follows:

	Production, tons	Shipments, tons	Orders booked tons	Per cent cap. operated
July	70,600	69,618	61,358	73.5
Total (7 mos.)	538,582	532,846	525,906	70.4
Aug.	69,173	69,824	62,541	70.6
Sept.	59,087	62,571	52,647	61.2
Oct.	65,526	58,733	61,164	66.7
Nov.	46,459	46,487	40,145	47.7
Dec.	46,029	47,689	43,475	47.3
(year)	824,856	818,150	785,878	71.3
Jan.	61,381	57,820	58,009	61.6
Feb.	65,942	59,971	61,606	67.4
March	63,464	65,164	60,915	64.6
April	61,898	60,749	54,564	63.1
May	62,035	60,884	54,685	53.6
June*	39,269	43,739	33,415	40.4
July	31,099	32,422	34,731	31.1
Total (7 mos.)	385,345	380,976	358,471	54.5

*Revised.

Boiler Orders Decline

Orders for steel boilers in July, as reported to the department of commerce, totaled 1309, with 1,410,096 square feet of boiler surface, compared with 1360 boilers with 1,588,553 square feet in June. The total for seven months is 7761 boilers, compared with 10,777 for seven months of 1929. Square footage for seven months was 8,682,854 in 1930 and 11,818,801 in 1929.

Great Lakes Pours Steel

Great Lakes Steel Corp., Pittsburgh, started pouring steel from its open-hearth plant at Ecorse, Mich., last week. No formalities accompanied this start of activities. The plant consists of six furnaces of 150 tons capacity each. The company is a unit of National Steel Corp.

EDITORIAL

Industry Pointing Way To Better Government

GENIUS for business and industrial organization in the United States has so far outstripped our ability for government that it was easy for James W. Gerard, former ambassador to Germany, to say that 40 financiers, industrialists and business men rule this country. Mr. Gerard, taking part in the British tariff discussion assured England that if it had these 40 men, if it adopted free trade within the empire, and if it erected a high tariff wall against the rest of the world, the per capita wealth in Great Britain in ten years would exceed that of any other country on the globe. He neglected to say if it would be necessary for them to take with them their own wealth.

The forty men, later increased to 59 and then to 64, should feel proud of the appointment, but if they went to Great Britain they would learn what some geologists now know, and that is that Britain lacks the resources in iron ore which the United States possesses and which are vital to Britain's future. Private interests have been extending their control over iron ore deposits in Spain and Brazil to make up in some measure for this deficiency. Britain is importing half her iron ore, losing steadily in world competition with the United States and western Europe, and will continue to lose unless she finds a cheap and abundant supply of ore.

The supermen might make a valiant attempt to overcome this handicap, but new supermen would arise in their place in the United States, and if Great Britain would have a prohibitive tariff barrier against American products what chance would there be for that closer union of people and interests on which the welfare of Great Britain and all other nations depends?

Making «Machines» of Men?

Here in America we know that industry, aided by science, has progressed far beyond the progress in law and government; it is the "industrial age" and if industrial leaders are pictured as being the real "power behind the throne" whose fault is it? Industry has been accused of transforming men into machines; what of the masses of people going to the polls and voting as political "machines" dictate? The government has been attempting to prohibit unfair practices in business and industry; what if industry, as Calvin Coolidge came near saying, demanded a stop to unfair practices in government? Some of the unfair practices in government are extravagances, excessive taxation, mismanagement, and failure of law enforcement.

As to the effectiveness of industry in meeting its every-day problems there can be little doubt; it has a higher standard of integrity than formerly; a keener perception and more general fulfillment of its obligations to society. Government, on the other hand, has failed to meet many of its elemental problems. We are speaking now more especially of the myriads of local governments, built on machine politics, that stand helpless before gangster rule—and almost paralyzed when it comes to doing some things urgently needed for the business, financial or industrial development of their communities.

Financial Rewards Are Greater

Crime goes unsuppressed, and industry often is repressed in many localities where public offices are dominated by those whose chief qualifications are their ability to "get the votes." A leading university appoints a commission of lawyers and sociologists to determine why the courts fail to function in accordance with the modern needs. The age-old suggestion that public officials be drawn from colleges and universities, has not produced the men, because industry offers larger remuneration. The public has seldom tried the experiment of paying adequately for and insisting on a high degree of intelligence in public office, because the public does not have sufficient faith in the calibre and honesty of the men it elects.

Fundamentally, the form of government is sound; the difficulty with its management goes right back to the machine-type of voter, and what shall be said of him?

Industry is conducting its business more effectively than ever before, and it is industry that offers the strongest hope of the future for better government. As wealth is being diffused, so is education; we are young, but the results will eventually be realized. In its own immediate sphere of influence industry is making men more intelligent in each succeeding generation. There need be no alarm about "industrialization;" industry always precedes a higher order of social organization. Industry employing millions is a vast institution teaching common sense, self-reliance, initiative, and rewarding men according to their merits. It is not the foe, but the friend of good government.

Shall We Help or Hinder

Soviet Russia

in Its Experiment with Communism?

BY HUGH L. COOPER
Consulting Engineer

COMMUNISM, the great experiment of Soviet Russia, is being watched by every industrial nation of the world. It is of special interest to the United States, not only because this country is founded on the capitalistic idea, but also because the soviets have turned to America for service and equipment for their five-year plan.

STEEL *presents the accompanying article as the view of an American who has dealt with the Russians and knows their characteristics. The author, Hugh L. Cooper, is consulting engineer,* 101 *Park avenue, New York. The article is abstracted from Mr. Cooper's address before the Institute of Politics, Williamstown, Mass., Aug.* 1, 1930. —THE EDITORS.

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WE are face to face today with two radically different schools of thought—capitalism and communism. The time has arrived when communism, however much we differ with it, and however much we disbelieve in what it advocates and stands for, is now trying to compete with capitalism for world supremacy. In this competition communism is led by strong men who sincerely believe that Marxism and Leninism will certainly be the victor. Obviously it is of the greatest importance, not only to the people of Russia but to the people of the outside world as well, that this great experiment shall be made with the least hindrance and with all possible speed.

What is our attitude to be toward them while they are trying out this experiment? I believe it should be friendly and helpful in the fullest degree, because anything the outside world can do to speed the day when the result can be set down in the pages of history for everybody's competent scrutiny the better it will be, not only for the Russians but for the balance of the world.

I am of the opinion that progress in Russia's experiment would be greatly helped if the communists would abandon their ideas of world propaganda and their belief in the imminence of a world revolution toward communism. The outside world, however friendly it may be disposed, cannot constructively aid these people when they are preaching the forceful overthrow of all other governments throughout the world. One of the greatest difficulties now confronting the Soviet government is found in the fact that the Third Internationale, domiciled in Moscow, represents 25 or 30 different nationalities from scattered points all over the world, and the idea that exists in Moscow generally, that if they were to attempt the expulsion of this international organization or fellow believers in communism, the Communist party would greatly weaken its prestige at home and abroad and seriously jeopardize their opportunity to fully try out communism in Russia.

When we examine communism we find that, after all, it is an expression of dissatisfaction with existing economic conditions. When we consider that in Germany today over 2,300,000 unemployed are receiving state aid, and nearly this same number of unemployed in England are on the dole also, we should not be greatly surprised if Moscow erroneously believes a world revolution may be approaching.

No Graft in Russian Buying

From our own experience and from absolutely reliable sources, we know that during the last seven or eight years more than $600,000,000.00 of actual business has been carried out between American business men and Russia, and that never in a single instance has a penny of graft been suggested or given. There are two paramount reasons for this honesty, one of them being that it is the best policy and the other that the communist, in my opinion, believes in honesty per se.

Another point I wish to bring out is that the communist leaders in Russia are for the most part men of great intellectual ability and that they practice what they preach. I have met and had long conversations with Stalin, Rykov, Rudzutak, Litvinoff, Kuibyshev and many others, and they are certainly working for what they believe will produce better conditions for all of their people with a zeal and unselfishness that challenges one's admiration.

Last fall I spent an evening with Rudzutak at his very modest farmhouse country home 20

miles outside Moscow. At the time, besides occupying other governmental posts of responsibility, he was commissar of transportation, bossing 55,000 miles of railway and receiving for all this a salary of $110 a month. Parenthetically, his father is a janitor on 125th street in New York city. Rudzutak has a college education, spent ten years in prison for his political beliefs and when I chided him about the smallness of his monthly salary his reply was, "We communist leaders can never be paid any more until we raise the standard of living of our 150,000,000 people far above what it is now."

I find the Russian people naturally hospitable and friendly. They are capable and thirsty for knowledge and we all know these qualities are essential in the development of any nation. They are looking particularly to America now for guidance in building a new Russia and I believe we can extend this aid without departing from or sacrificing any of our own ideals.

Soviets Have Altered Policies

Note particularly some of the modifications the government has made in its original policies during the time we have been in Russia:

In the beginning, the laborers accomplished their own discipline through the operation of committees. Now this discipline is administered by a single individual authority, who is held responsible for the amount of work accomplished by labor.

Up to last year, the foreign trade of the Soviets was conducted by two departments, one for imports and the other for exports. During the last year foreign trade has been decentralized and special import and export corporations dealing with particular commodities have been organized for the carrying on of Soviet foreign trade.

Another radical change is the introduction of piecework and the bonus system in the payment of labor, this having been found necessary to bring the production up to what was desired.

Four years ago the maximum for any communist was 225 rubles per month. Now the law has been changed so that the compensation for communist engineers and technicians, as well as non-communists, may be greater than 225 rubles and may be even a thousand rubles a month, according to the actual individual abilities they display in their work.

These and other changes that have taken place all prove to me that however rigorous the original communistic principles in the Soviet law may have been, they have been modified by decree as the men in power found it necessary and desirable. I believe that many more modifications will be made as their need is demonstrated, all in the interest of better economic conditions for the people. I believe these modifications will be dictated entirely by the communists and that all the hopes that may be held in different parts of the world that the time will come when Russia will go back 100 per cen to capitalism as we know it, are hopes without foundation.

In brief, communism means that the state shall own and control all property and that its people shall in a very large degree live in equality with one another. Therefore, the communist plan really means that 150,000,000 people are to work out a system which is designed to eradicate human selfishness on a scale that has never been attempted before anywhere in the world.

According to the communist plans and ideals the words "commercial competition" are to be practically eliminated. Incentives for private gain cannot exist because the state is to own everything. Whether a permanently satisfactory industrialization can ever be brought about with the words "commercial competition" taken out of the formula or whether this plan will result in the breaking down of personal initiative is a question we will all await the answer to with deepest interest.

Looking at the picture of Russia as it is today and comparing it with the Russia of 1914, no matter how much we disapprove of communism, we are compelled in fairness to admit that substantial progress has been made in industrialization, education and social welfare work.

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I will conclude by asking a question:

Russia and the United States of America have within their combined boundaries about half of the known natural resources of the world. In the last analysis, natural resources are the foundation of all human progress, and the degree of intelligence employed in their development determines the health and happiness of all people.

The United States is developing its natural resources under the private ownership plan and will continue to do so. Russia is developing its natural resources under the communistic or state ownership plan and will continue to do so until its leaders learn from experience that they must change. The future economic history of the world largely depends on the outcome of this unavoidable competition.

My question is:

Which Plan Is Better?

Should we in the United States express our confidence in our plan by saying to Russia, "We accept your challenge, and if permitted we will help you in your experiment in every friendly reasonable way," or should we say in effect, "We fear this competition and, therefore, we will do all we can to hinder you."

Which plan do you think will help the future happiness of the world the most?

THE BUSINESS TREND

False Starts Are Numerous in Business Recovery

BUSINESS is so anxiously awaiting tangible signs of improvement that sentiment responds nervously to the slightest indication of change. Last week an insignificant rise of 1 per cent in steel operations was seized by a number of commentators as a basis for renewed optimism. Likewise, the favorable predictions by Colonel Ayres, Roger Babson and others have been taken at more than face value by many readers.

These experts agree that the low point has been passed and that business is improving and will continue to improve. However, thousands who read these encouraging words expect to witness immediate signs of improvement. Thus far it is extremely difficult to put one's finger on definite evidence. Therefore, there is danger that optimism may get too far ahead of fact.

Now it is fairly certain that August will come to an end without having witnessed any important recovery in business. Some figures for August probably will be worse than those for July, but the average should be slightly better. Industrial activity for the current month, as measured by the various barometers, is not likely to show more than an almost imperceptible gain over July. Commodity prices may register a slight upturn, due to the effect of the drought threat on food products, but the prices of engineering materials are still tending downward.

Apparently the steel industry cannot look to the automobile builders for representative tonnage for some months to come. The current picture at Detroit is not reassuring. A number of automobile companies, which resumed operations recently, again are considering extended layoffs or shortened weeks. Here we have tangible evidence of the condition discussed in this column last week, namely, that the present business recovery will be marked by many false starts.

The Barometer of Business

Industrial Indicators

	July, 1930	June, 1930	July, 1929
Pig iron output (Daily average, tons)	85,110	97,817	122,016
Machine Tool Index	117.3	146.7	294.8
Unfilled orders (tons)	4,022,055	3,968,064	4,088,177
Ingot output (Daily average, tons)	112,823	137,610	186,561
Dodge Bldg., awards in 37 states (sq. ft.)	44,604,200	48,214,200	75,463,700
Automobile output	275,298	350,565	518,301
Coal output, tons	34,634,000	33,714,000	41,175,000
Business failures; number	2,028	2,026	1,752
Business failures; liabilities	$39,830,000	$63,130,000	$32,430,000
Cement production, Bbls.	17,080,000	17,237,000	17,315,000
Cotton consumption, bales	378,835	405,181	547,165
Car loadings (weekly ave.)	888,933	929,862	1,040,020

Foreign Trade

	July, 1930	June, 1930	July, 1930
Exports	$269,000,000	$295,153,000	$402,861,000
Imports	219,000,000	250,236,000	352,980,000
Gold exports	42,529,000	26,000	810,000
Gold imports	21,888,000	13,938,000	35,530,000

Foreign Exchange

	Normal	July, 1930	June, 1930	July, 1929
Sterling	$4.867	$4.866	$4.859	$4.852
Francs	3.918c	3.935c	3.925c	3.917c
Lira	5.260c	5.239c	5.239c	5.231c
Marks	23.830c	23.874c	23.854c	23.830c

Financial Indicators

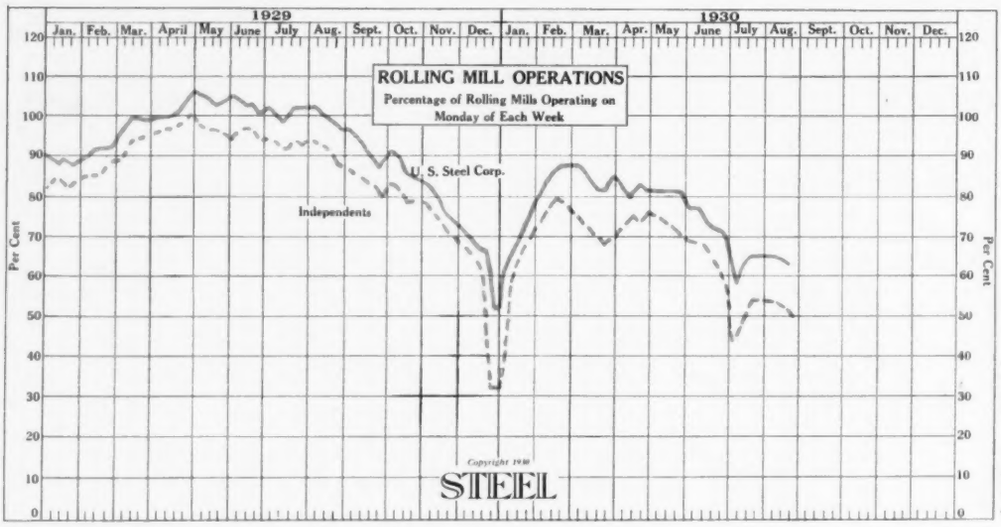
	July, 1930	June, 1930	July, 1929
25 Industrial stocks	$286.57	$276.68	$416.09
25 rail stocks	112.52	109.33	147.52
40 Bonds	87.81	86.40	86.52
Bank clearings (000 omitted)	$46,460,765	$49,910,305	$59,919,892
Commercial paper rate N. Y., per cent)	3-3½	3¼-3¾	6-6
*Commercial loans (000 omitted)	$8,536,000	$8,434,000	$9,164,000
Federal Reserve ratio, per cent	80.7	82.2	72.9
Railroad earnings**	$68,881,473	$69,173,825	$105,817,808
Stock sales, N. Y. stock exchange	47,746,090	76,593,250	93,378,690
Bond sales, par value	$190,802,300	$226,148,300	$304,259,950

*Leading member banks Federal Reserve System.

**June, May and June respectively.

Commodity Prices

	July, 1930	June, 1930	July, 1929	Monthly average, 1913
Steel's composite average of 14 iron and steel prices	$33.21	$33.53	$36.71	$26.32
Bradstreet's index	10.45	10.56	12.63	100
Wheat, cash (bushel)	.89	.99	1.01	92c
Corn, cash (bushel)	.81	.77	.99	51c
Petroleum, crude (Bbl.)	1.18	1.18	1.30	$2.50


1929
1930
Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec.
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
ROLLING MILL OPERATIONS
Percentage of Rolling Mills Operating on Monday of Each Week
U. S. Steel Corp.
Independents
Per Cent
Per Cent
120 110 100 90 80 70 60 50 40 30 20 10 0
Copyright 1930
STEEL

U. S. Steel Corp.
Per Cent of Capacity

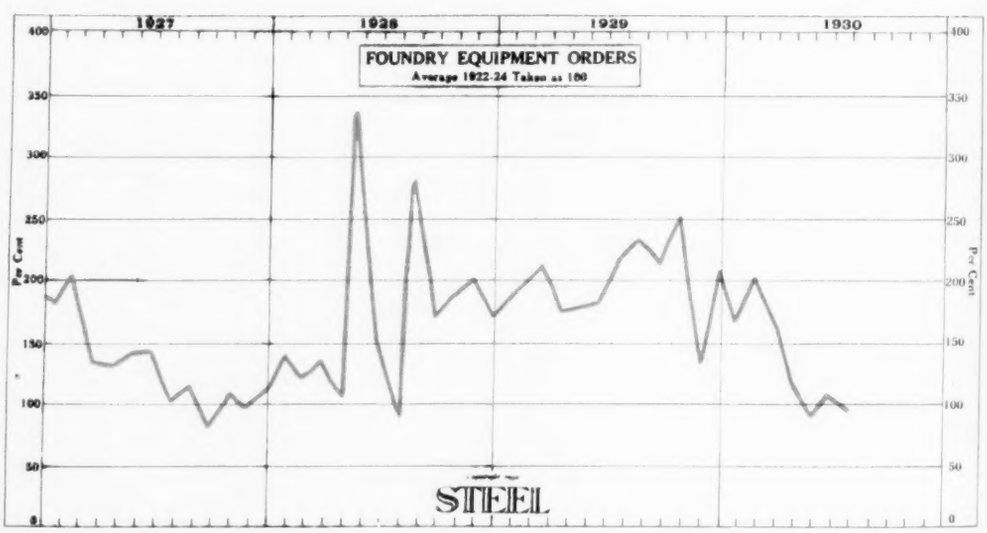
	1930	1929
August 18	62	95
August 11	63	97
August 4	64	100
Independents		
August 18	49	87
August 11	51	90
August 4	53	92
Industry		
August 18	55	90
August 11	56	93
August 4	58	95

Steel Operations Show Little Change for the Industry

Steel operations for the week beginning Aug. 18 remained approximately the same as for the previous week. While the Steel corporation reduced its rate of activity less than one per cent, independents curtailed their operations about twice this amount, bringing the average for the industry down slightly. At present the Steel corporation is working about 62 per cent capacity while independents are at the 49 per cent level. The average for the industry is a little better than 55 per cent which is the lowest rate since last December when activity was reduced to 40 per cent. With indications that the fall seasonal improvement is near at hand the future appears to be more optimistic for the industry.

Foundry Equipment Orders Slump To Lowest Level Since 1927

The index of gross orders for foundry equipment during July dropped to the lowest level since September, 1927. The index, as compiled by the Foundry Equipment Manufacturers' association, for July stands at 90.6 as compared with 102.1 for June, 219.3 for July, 1929, and 94.8 for July, 1928. This represents a decline of 11 per cent for the month and 60 per cent from the corresponding period one year ago. Since orders fluctuate sharply and were at such a low point in May, it appeared that in June the turn towards recovery had been made. In light of July figures the June rise was a false start. However, orders are at such a low level that the July drop only increases the faith of a near rise towards recovery.



Per Cent

	1930	1929
July	90.6	219.3
June	102.1	177.3
May	92.7	177.7
April	122.8	172.6
March	164.1	209.4
February	196.4	197.0

Production

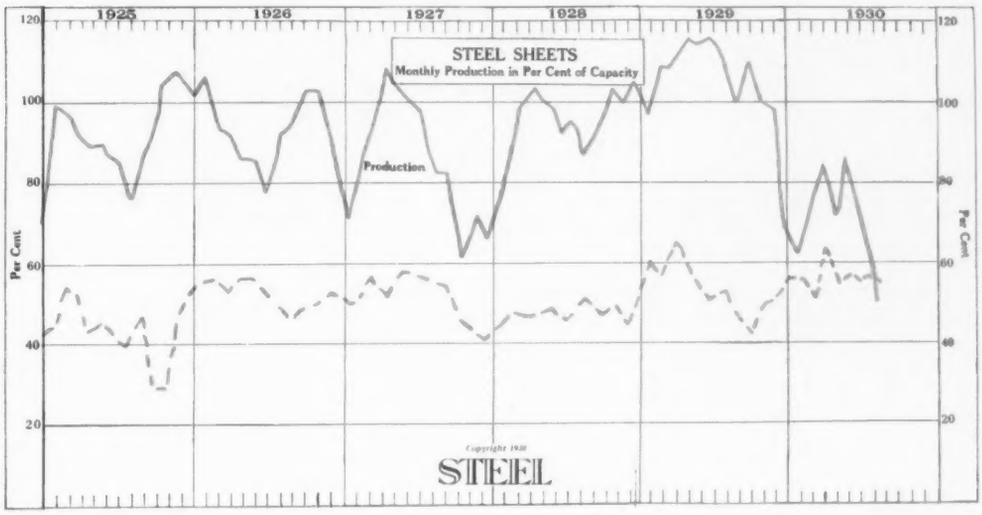
Per cent of capacity

	1930	1929
July	50.4	98.1
June	58.8	110.4
May	73.3	115.8
April	84.0	115.2
March	73.7	115.2
February	83.9	109.7

Stocks

Per cent of capacity

	1930	1929
July	54.9	46.9
June	57.3	53.5
May	54.7	49.4
April	56.6	53.8
March	54.6	59.7
February	61.4	63 3

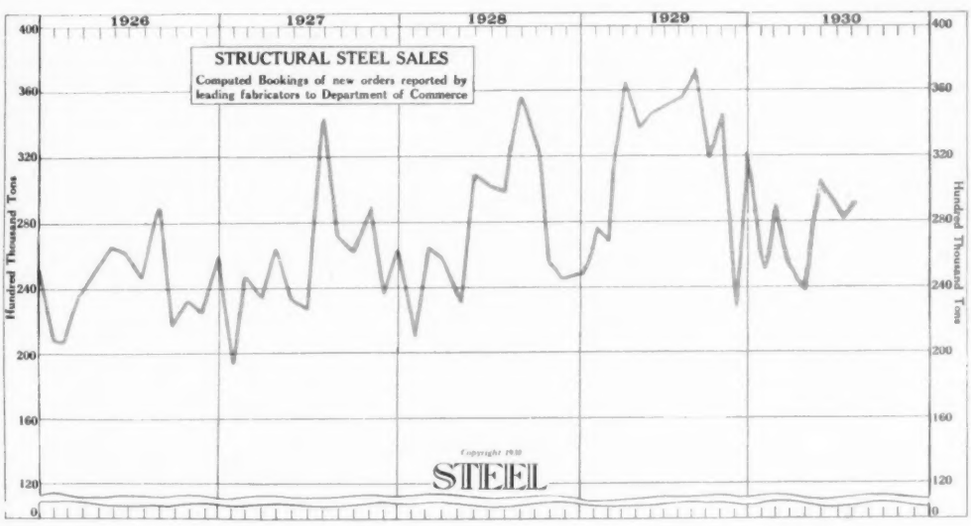


July Steel Sheet Production Falls 14 Per Cent; Stocks Also Decline

Steel sheet production in July again dropped to a new low for the year. According to the National Association of Flat Rolled Steel Manufacturers, steel sheet producers operated at 50.4 per cent capacity during July, producing 186,206 tons. This compares with an operating capacity of 58.8 per cent in June and 98.1 per cent one year ago, or respective declines of 14 and 49 per cent. Stocks on hand, likewise, declined for the month, amounting to 54.9 per cent of capacity compared with 57.3 per cent in June, a decrease of 4 per cent. In spite of this reduction stocks are well above last year's 46.9 per cent figure. The dull sheet situation is still reflecting the low activity of the automobile industry.

Structural Steel Orders Show Small Increase in July

New orders for structural steel, as reported by principal manufacturers to the department of commerce, rose slightly during July. The rise of approximately 3 per cent for the month carried orders to 284,000 tons, the second highest figure for the year, which was also reached in February. July's total compares with the revised figure of 276,000 tons for June and 350,350 tons for July one year ago. While July figures are 19 per cent below July, 1929, the seven months' total of structural orders for 1930 amounts to approximately 17 per cent below the corresponding period of 1929 but 5 per cent above those of 1928. Structural orders still continue to find most encouragement from New York and vicinity.



	Tons 1930	1929
July	284,000	350,350
June	276,000	342,650
May	296,000	342,650
Apr.	236,000	334,950
Mar.	248,000	354,200
Feb.	284,000	265,650

Don't Miss This Year's Most Important Events of

METAL PROGRESS

NATIONAL METAL CONGRESS
and
NATIONAL METAL EXPOSITION

STEVENS HOTEL
CHICAGO
SEPTEMBER 22-23-24-25-26

DON'T MISS the more than 40 technical sessions of the six cooperating technical societies . . . . . sessions that will cover every phase of the production, selection, fabrication, inspection, treatment, welding and application of all kinds of metals.

Don't miss the hundreds of exhibits, many of them in operation, that give you the one opportunity of the year to compare side by side the new equipment and processes in which you are interested.

Don't miss meeting and rubbing shoulders with the important metal experts from this country and the whole world.

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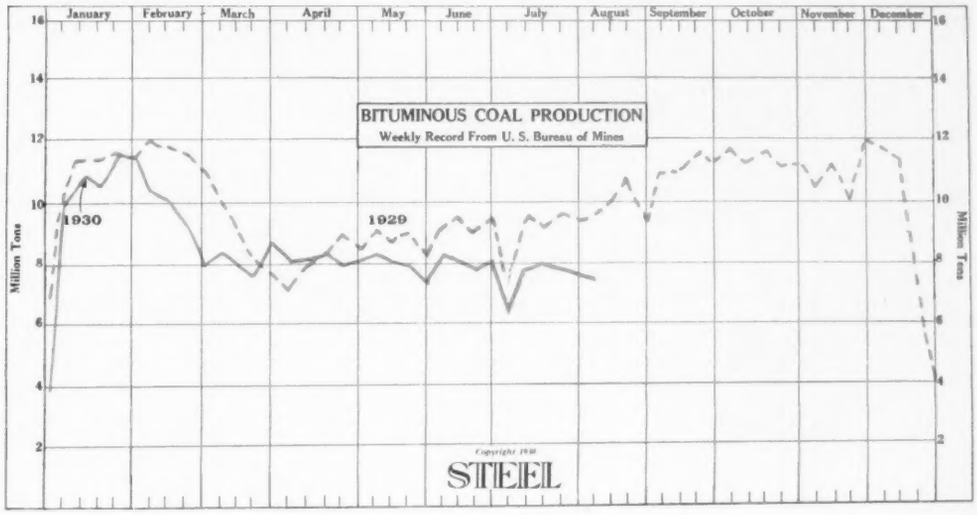
BE IN CHICAGO THE WEEK OF SEPTEMBER 22 to 26



Tons

	1930	1929
July	34,634	41,175
June	33,714	38,580
May	35,954	40,706
April	35,860	37,380
March	35,773	39,870
February	39,555	47,910

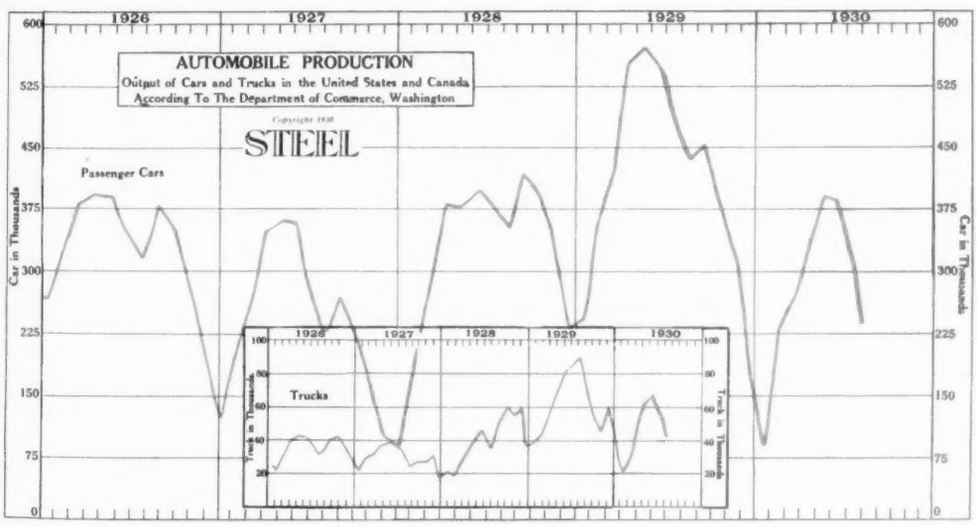
Bituminous Coal Output Is Slightly Higher in July

July bituminous coal production showed a small increase over the preceding shorter month of June. Output for July totaled 34,634,000 tons as compared with 33,714,000 tons for the previous month. In spite of the 3 per cent July increase, production is far below 1929.

Weekly production, on the other hand, has been declining since the 8,084,000 ton level reached during the week of July 26. From this figure production has successively declined to 7,991,000 and 7,850,000 tons per week. For the past 4 months weekly production has fluctuated within a narrow margin around the 8 million-ton level. However, with the return of the fall months and colder weather, production may be expected to move upward.

Automobile Production Falls Off 23 Per Cent in July

Automobile production in the United States and Canada, according to the figures compiled by the department of commerce, fell 23 per cent in July. During the month 231,256 passenger cars were produced which contrasts with 301,898 units in June, 439,598 in July, 1929 and 357,682 in July, 1928. Truck production, likewise, decreased, though at a slightly lower percentage rate. Passenger car output fell 23 per cent from the previous month but 47 per cent from one year ago and 35 per cent from two years ago, while truck production declined 15 per cent from June, 48 per cent from July, 1929 and 31 per cent from July, 1928. The number of trucks produced during July totaled 41,295 compared with 48,669 in June.

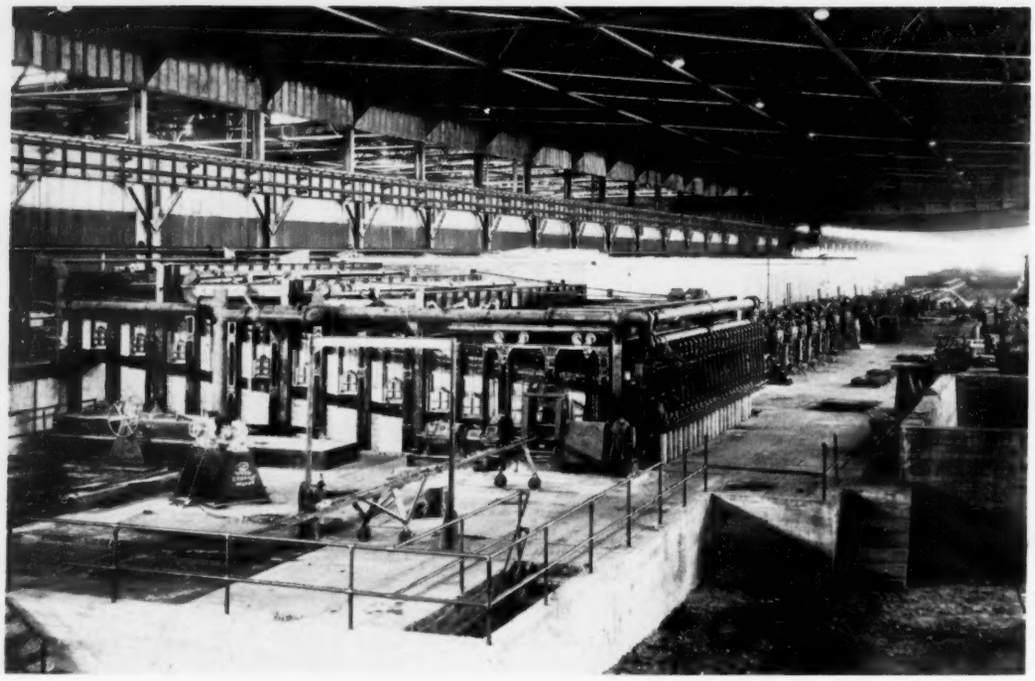


Passenger Cars

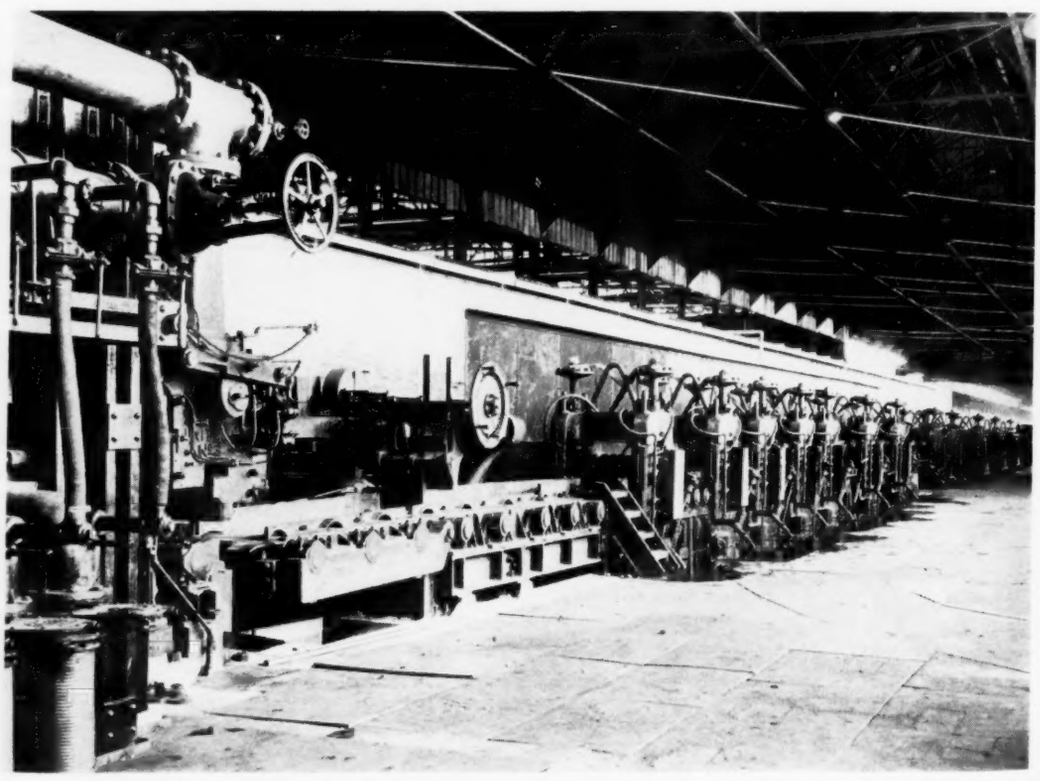
	1930	1929
July	231,256	439,598
June	301,898	469,260
May	384,287	541,310
Apr.	396,350	571,956
Mar.	354,274	546,489
Feb.	310,504	431,755

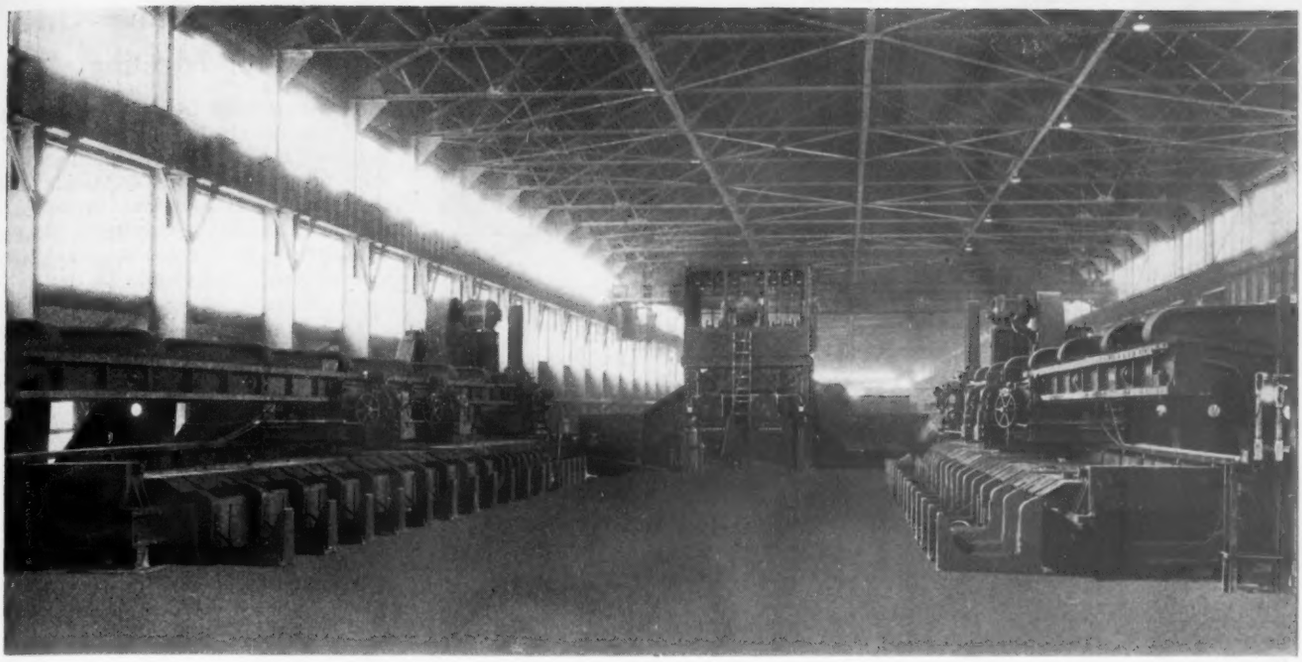
Trucks

	1930	1929
July	41,295	78,703
June	48,669	98,164
May	57,791	94,940
Apr.	70,945	91,855
Mar.	67,769	79,587
Feb.	51,984	65,950



LOOKING from the front to the rear of Inland Steel Co.'s new 10-inch bar mill. Furnace in which billets are reheated is shown in foreground. Air for combustion is preheated in a mantle-type recuperator. Mill and hot bed may be seen in the right background. Below is shown the discharge end of reheating furnace, billet shear and runout table to the 15 stands of rolls. The first seven stands are 14-inch, the next five 12-inch and the last three 10-inch





Shear back tables serving hot bed. Each table is equipped with comprehensive gaging units and scale pockets. Operation of the hot bed is controlled from the pulpit in the center background

New 10-Inch Merchant Bar Mill Awaits Trade Demands

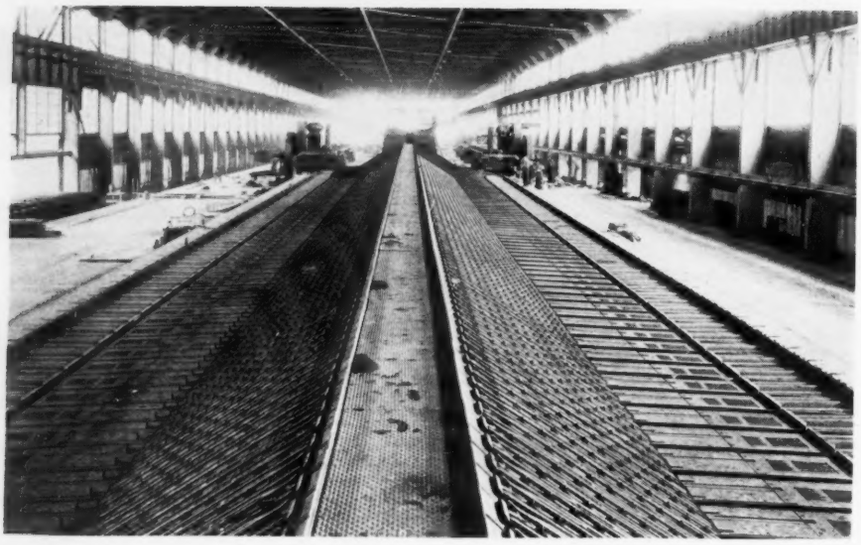
Billet Furnace Fired with Coke Oven Gas—Rollers of Mill Runout Table and Hot Bed Approach Table Have Individual Motors

ADDITIONAL merchant bar capacity in the Chicago district is afforded by the completion of a new 10-inch mill at the Indiana Harbor works of the Inland Steel Co. The new installation gives the Inland company three modern mills catering to the demands of the merchant bar trade. Finishing on 10-inch rolls, the new mill is equipped to produce the smaller sizes of rounds, flats, squares and shapes, as well as bands down to No. 12 gage and coiled material.

The new mill is housed in a modern structure 2000 feet long and 100 feet wide in which particular attention has been paid to adequate lighting. From the existing continuous billet mill, billets ranging in size from 1¾ to 3 inches square, are carried to one end of the mill by special cars which have stakes at the side and the center for convenience in handling the billet-lifts. Each 15-ton lift is carried in a chain sling; the billets are handled out of the car into the billet storage by a 15-ton crane. While the billets remain in storage the chain is allowed to remain about the lift so that it is ready to be picked up again without delay or unnecessary expense. Next in line with the billet storage is the billet scale, where the 30-foot billets are made ready for the continuous reheating furnaces shown in the illustration on the opposite page.

The furnace is of the side-charge and discharge type, has a slope of 1½ inches per foot, and a roof of the flat, suspended type. The distance from the center of the inlet door to the center of the discharge door is 45 feet. Coke-oven gas is used for fuel, air being preheated in a Mantle-type recuperator. The billets are charged by an electric mule and a driven table, the mule operating on the table's side guards. The billets are progressed through the furnace by an electric pusher.

Just beyond the preheating furnace in the mill proper consisting of 15 stands in line. The first seven stands have 14-inch rolls; the



Hot bed of the double-escapement type. Runout tables on either side of the bed lead to downcut shears shown in the background

next five, 12-inch rolls and the last three, 10-inch rolls. Stands Nos. 2 and 3 are driven by one motor, as are stands Nos. 4 and 5. The remaining 11 stands have individual motor-drive. These motors have a two-to-one speed-range with full voltage; two generators provide them with an additional speed range below the full-voltage low speed.

Stands Nos. 10, 12 and 14 are vertical mills designed to function as full working stands. They are so arranged that the vertical rolls may be raised or lowered to keep the bar in a straight line regardless of which pass in verticals is being used.

Looping-tables are provided before and after each vertical stand, these permitting a side or down-loop according to the requirements of the material being rolled. A flying shear is installed after the No. 7 stand to crop the front ends of the billet. A Rendleman-type flying shear has been installed after stand No. 15. The mill will have a finishing speed of 2000 feet per minute. The operator's pulpit faces the line of stands and the motor-room is behind the line.

Table Rollers Driven Singly

Material from the final stand is delivered to a Treadwell-type hot bed, shown above. This is a double bed of the escapement type with provision for the continuous stacking of flats for annealing. The mill runout-table and the hot bed receiving table are equipped with individual motor-rollers The two hot bed runout tables deliver finished material to the shears, where comprehensive gaging equipment, shown in the illustration on the preceding page, insures shearing of the material to accurate lengths. The electric controls for the hot bed and the tables are installed in a room below the floor, this arrangement leaving the mill remarkably free of obstructions.

Material May Be Coiled

As an alternative to the movement of stock previously mentioned, the material from the stands may be delivered to coilers off to one side, thence to a cooling conveyor 800 feet long. This terminates at the shipping end of the building. Also provided here are facilities for unloading material from the conveyor to trucks where it is weighed before shipping. An electric transfer-table capable of handling material 70 feet long makes it possible to transfer finished material to or from the adjoining 14-inch merchant mill.

The new mill is equipped with two 15-ton shipping cranes with 100-foot span and traveling cages. A third similar crane handles billets to the furnace, while a fourth crane with a 20-ton capacity serves the mill. The general arrangement of the mill is to be seen in the layout below.

Metallurgical Group Gives Program for Meeting

The American Institute of Mining and Metallurgical Engineers has announced the programs for the meetings of its Institute of Metals and Iron and Steel divisions to be conducted at the Stevens hotel, Chicago, Sept. 22-26, during the National Metal congress. In addition to the technical features listed below, the institute has arranged visits to plants of the Illinois Steel Co., Republic Steel Corp., Western Electric Co., and International Lead Refining Co.

Details of the program, as announced, are as follows:

Iron and Steel Division

Monday, Sept. 22

MORNING

Iron Ore Session

"Some Aspects of the Iron Ore Situation," by F. B. Richards.

"Beneficiation of Iron Ores from the Blast Furnace Viewpoint," by R. H. Sweetser.

"Resistance of Iron Ores to Decrepitation and Mechanical Work," by T. L. Joseph and E. P. Barrett.

AFTERNOON

Iron Ore Round Ttable

Thursday, Sept. 25

MORNING

Alloys Session

"Practical Observations on the Manufacture of Basic Open-Hearth High-Carbon Killed Steel," by W. J. Reagan.

"Development of Casing for Deep Wells," by F. W. Bremmer.

"Manufacture of Basic Open-Hearth Steel of Forging Quality," by William R. Fleming.

Institute of Metals

Wednesday, Sept. 24

AFTERNOON

"Influence of Casting Practice on Physical Properties of Die Castings," by Charles Pack.

"Effect of Certain Alloying Elements on Structure and Hardness of Aluminum Bronze," by Selma F. Hermann and Frank T. Sisco.

"Thermal Conductivity of Copper Alloys. Part II—Copper-Tin Alloys. Part III—Copper-Phosphorus Alloys," by Cyril S. Smith.

"Application of X-Rays to Development Problems Connected with the Manufacture of Telephone Apparatus," by M. Baeyertz.

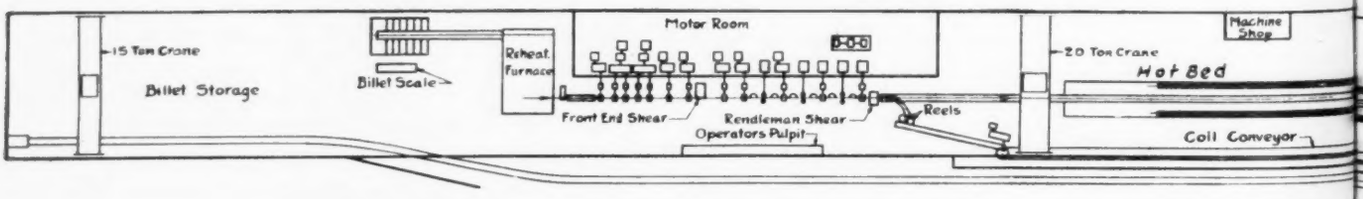
Thursday, Sept. 25

AFTERNOON

Alumni Session

"Constituents of Aluminum-Iron-Silicon Alloys," by William L. Fink and Kent R. Van Horn.

(*Concluded on Page* 45)



General arrangement of the new 10-inch merchant bar mill. A transfer table designed to ha

Seek To Develop Low-Grade Domestic Chromite Ores

WIDENING applications of chrome-nickel steels and increasing tonnages being required are placing more and more dependence upon the supply of chromite ore, the only present commercial source of chromium, and in view of the dependence of the United States on foreign countries for this ore, a study of methods for beneficiating domestic low-grade chromite ores is being conducted by the bureau of mines, Washington.

In a recent year this country consumed 60 per cent of the world's production of chromite and produced none. If imports of this ore were suddenly to be cut off American industries would be seriously crippled and since this country has only small amounts of chrome ore of high enough grade to meet present trade requirements it appears prudent to determine how this ever-increasing need for chromium can be met.

Low Silica Content Specified

For refractories a minimum of 40 per cent chromite and a low silica content is usually specified. In most instances bricks or lumps having a physical structure that will not crack when heated are required. The only manner in which an inferior ore could be adapted to this use would be to concentrate it and develop a satisfactory binder to make bricks from the concentrates. Requirements for ferrochrome are a minimum of 45 per cent chromite and an iron content not exceeding one third of the chromic oxide. On some low-grade ores gravity concentration will yield a product meeting these requirements; other ores yield concentrates containing too much iron or other impurities to be salable.

The chemical trade demands an ore containing 50 to 55 per cent chromite; silica, alumina and magnesia are considered undesirable but unavoidable impurities. Ore from New Caledonia is preferred and commands a higher price. Current quotations on various grades of chrome ore range between $21 and $25 per ton, f.o.b. Atlantic ports.

Chromite is smelted in the electric furnace to produce ferrochrome, which in turn is used to make the various types of alloy steels containing chromium. Pure chromium, required for special alloys of low iron and carbon content, formerly was made by thermit reduction of chromic oxide, but at present much of it also is being made in the electric furnace.

Nearly all other uses, excepting refractories, involve the production of chromates by a chemical treatment of the ore. The usual treatment involves roasting the ore with lime and soda ash and leaching sodium chromate from the calcine. The sodium chromate is converted to sodium or potassium dichromate, chromic oxide, chromic acid and various other salts and pigments. The rapid development of chromium plating has caused a substantial increased in the consumption of chromic acid.

Convert Ore to Chromates

A study of methods by which low-grade chromite can be converted to chromates, chromic acid and chromic oxide should be of value in the utilization of domestic ores and also may bring about improvements in the metallurgical treatment of imported ores.

First results of the series of investigations dealing with the chemical methods of treating chromite and the possible application of these methods to the utilization of low-grade domestic ores, being undertaken by the bureau of mines, are incorporated in report 2999, "Roasting of Chromite Ores To Produce Chromates," by H. A. Doerner, discussing the reactions involved in the roasting and leaching operations with reference to the effect of various common impurities, reagents employed and conditions during roasting and leaching. The report is available from the bureau of mines, Washington.

Reinforcing Steel Institute Plans Fall Meeting

The Concrete Reinforcing Steel institute will hold its semiannual meeting at Briarcliff lodge, Westchester county, N. Y., near New York City, on Oct. 20-22. An appropriate program of technical material and recreational interludes is being arranged.

During the past few months, the engineering department of the institute has secured the adoption of intermediate grade new billet steel as the single standard by a number of specifying authorities; and has also caused the eleven standard sizes of bars to be called for by most of the few remaining authorities.

Metallurgical Group Gives Program for Meetings

(*Concluded from Page* 44)

"Aluminum - Silicon - Magnesium Castings," by R. S. Archer and L. W. Kempf.

"Equilibrium Relations in Aluminum-Antimony Alloys of High Purity," by E. H. Dix Jr., F. Keller and R. W. Graham.

"Modulus of Elasticity of Aluminum Alloys," by R. L. Templin and D. A. Paul.

"Quenching of Alclad Sheet in Oil," by H. C. Knerr.

"Experiments on Retarding the Age-Hardening of Duralumin," by E. H. Dix Jr., and F. Keller.

Institute of Metals and Iron and Steel Divisions

Tuesday, Sept. 23

AFTERNOON

Joint Session on Theoretical Metallurgy

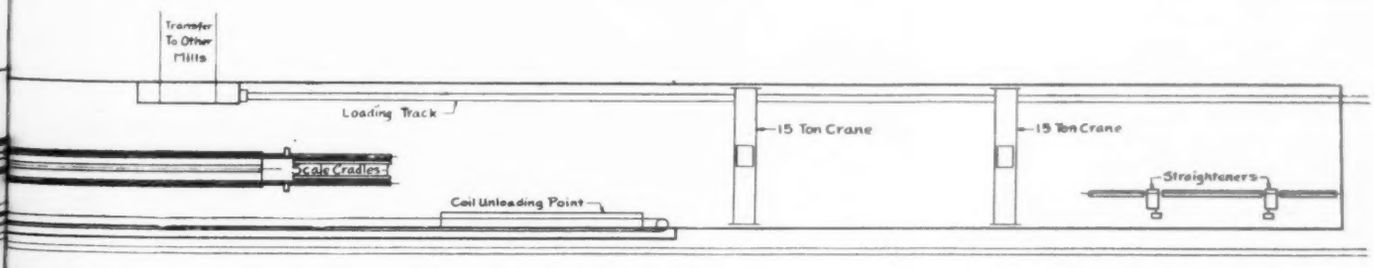
"Studies Upon the Widmanstatten Structure, I. Introduction; also the Aluminum Silver System and Copper-Silicon System," by Robert F. Mehl and Charles S. Barrett.

"Cemented Tunsten Carbide—A Study of the Action of the Cementing Material," by L. L. Wyman and F. C. Kelley.

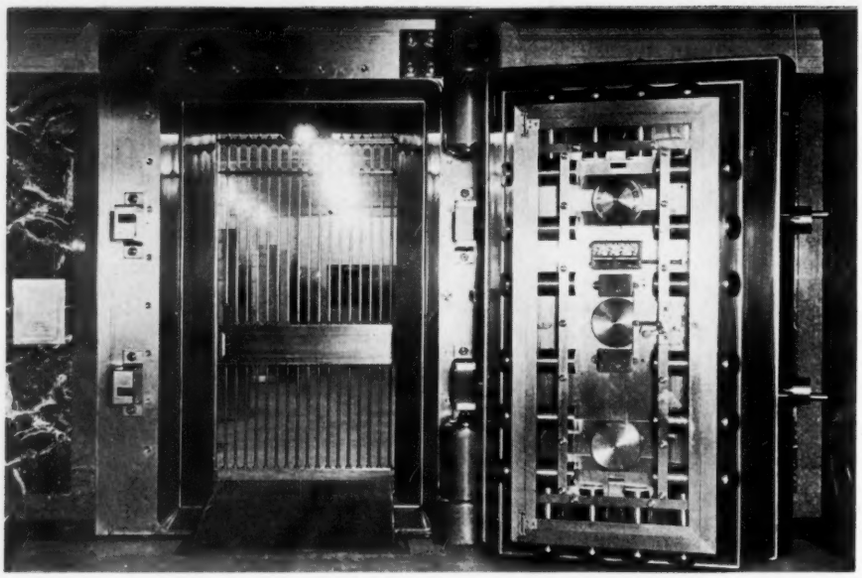
"Transformation of Austenite at Constant Subcricical Temperatures," by E. S. Davenport and E. C. Bain.

EVENING

Joint dinner of Institute of Metals and Iron and Steel Divisions. Dr. B. D. Saklatwalla, vice president, Vanadium Corp. of America, will present a non-technical address on "Vanadium."



terial in 70-foot lengths connects with a 14-inch bar mill located in an adjoining building



One of four 30-inch main rectangular doors being installed in the vaults of the Irving Trust Co., New York, showing bolt frame and bolts. Although approximately 42 tons, the steel door can be closed by a child

Chrome Steel Doors Guard Wall Street Securities

VAULTS and vault doors being installed in the new bank skyscraper under construction at No. 1 Wall street, New York, for the Irving Trust Co. will take close to 2000 tons of steel, much of it special castings. For the Bank of Manhattan vaults and doors, 40 Wall Street, 2100 tons was required. Installation in both banks was by the York Safe & Lock Co., York, Pa.

The world's largest vault and doors, however, are not in Wall street or the money-filled fortresses in United States mints. Under construction at Tokio is the world's largest steel guardian of gold and securities for the Bank of Japan, the York company also building this vault which will take 3500 tons of steel castings and plates. Doors will be 36 inches thick compared with 30 inches for the Wall street vaults.

Comparisons Show Size

Some idea of the amount of steel used in the building of these bank vaults may be derived by comparison. The average 16-story apartment takes from 1200 to 1600 tons of fabricated steel. A 28-story office building in New York recently was let calling for 2000 tons.

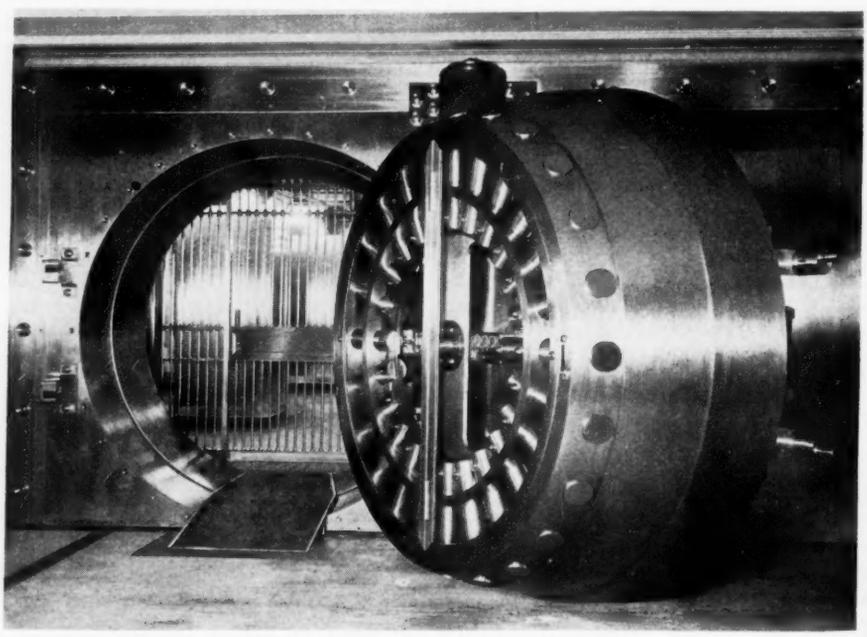
Castings and plates for large vault doors are let on contract by the York Safe & Lock Co. No rolling or melting is done by the company which buys finished, but unmachined material in the open market. Machining, fabrication and assembling is done in part at the 16-acre plant of the York company, although much of the actual engineering is done on the site of the job.

Cast steel, 5-ply chrome steel, hardened and drill proof, open-hearth steel, infusite, torch resisting, hard chemical plates and polished finish plates are materials used in the doors. Infusite, 5-ply chrome steel, open-hearth steel and hard chemical plate make up the bulk of the interior and exterior. The frame is also of cast steel which with the door is hand finished, polished to an accurate metal to metal fit and liquid proof at the junction of door and frame.

Rests On Solid Rock

The vault for the Irving Trust Co. rests on solid rock 69 feet below the street, well under the water level. The vaults are encased in more than 10,000,000 pounds of steel and concrete. The vault is protected by walls of concrete and steel 6 feet thick. In addition to the outer steel sheathing of the vault itself there is a thick layer of infusite, an alloy of copper and iron possessing high torch-resisting qualities; and a layer of solidified chemical which, under the heat of a cracksman's torch, would give off paralyzing fumes. In the protection of the vault many safeguards will be employed, among them a sound-detecting system wired to a loud speaker. This subterranean stronghold is one of the most impregnable ever constructed. Entrance through each of the several vaults is made through solid steel doors 30 inches thick. The walls of the vault are reinforced heavily and are lined with steel plates. Both the doors and the vault lining contain infusite, a torch-resisting metal. The doors are rectangular. The safe deposit vaults are of unusual size and are equipped with several thousand safe deposit boxes,

(*Concluded on Page* 56)



Circular vault door weighing 78½ tons in the Bank of Manhattan, New York. The door of cast steel, chrome steel, open-hearth plates and infusite, which is torch resisting, has a clearance of 90 inches and is 30 inches thick

Vanadium Additions Improve Properties of Steel

BY N. PETINOT

Assistant to President, Vanadium Corp. of America

Part II

CHROME-VANADIUM steels falling within the range of 0.23 to 0.33 per cent carbon, covered by the S.A.E. 6125 and 6130 types, are used extensively for automobile forgings. The following is the general shop procedure in the heat treatment of such forgings:

Normalizing: Heat to 1600 to 1650 degrees Fahr. (870 to 900 degrees Cent.)

Quenching: From 1560 to 1600 degrees Fahr. (850 to 870 degrees Cent.) in water or brine.

Tempering: At 1000 to 1120 degrees Fahr. (540 to 605 degrees Cent.) to a brinell hardness of 286 to 320, depending on requirements.

In the heat treated condition, such forgings have about the following range in tensile properties, accordign to the temperature used in tempering and the actual composition.

Yield point, lbs. sq. in.	115,000 to 140,000
Tensile strength, lbs. sq. in.	135,000 to 160,000
Elongation in 2", per cent	20 to 17
Reduction of area, per cent	65 to 60
Brinell hardness, number	286 to 340

Chrome-vanadium steel containing over 0.35 per cent carbon generally is used in the oil hardened state and has found widespread application for this class of parts, the particular carbon range employed being influenced by the size of the part and the service to be met.

The following is the general procedure in heat treatment of S.A.E. 6135.

Normalizing: Heat to 1600 to 1650 degrees Fahr. (870 to 900 degrees Cent.)

Quenching: From 1560 to 1650 degrees Fahr. (850 to 900 degrees Cent.) depending upon the section, in oil.

Tempering: At 500 to 1200 degrees Fahr. (260 to 650 degrees Cent.) to a brinell hardness of 444 to 207, according to requirements and size.

The range of physical properties is approximately:

Yield point, lbs. sq. in.	210,000 to 75,000
Tensile strength, lbs. sq. in.	225,000 to 100,000
Elongation in 2", per cent	8 to 25
Reduction of area, per cent	40 to 60
Brinell hardness, number	444 to 207

For highly stressed parts of 6145 and 6150, such as gears, shafting, etc., the general heat treatment procedure is as follows:

Normalizing: Heat to 1600 to 1650 degrees Fahr. (870 to 900 degrees Cent.)

Quenching: From 1560 to 1625 degrees Fahr. (850 to 885 degrees Cent.) in oil.

Tempering: At 450 to 1050 degrees Fahr. (230 to 565 degrees Cent.) to a brinell hardness of 550 to 320, depending upon requirements.

The range in physical properties is approximately:

Yield point, lbs. sq. in.	250,000 to 125,000
Tensile strength, lbs. sq. in.	270,000 to 150,000
Elongation in 2", per cent	6 to 17
Reduction of area, per cent	25 to 50
Brinell hardness, number	550 to 320

The heat treatment procedure for springs is usually:

Quenching: From 1560 to 1625 degrees Fahr. (850 to 885 degrees Cent.) in oil.

Tempering: At 850 to 1000 degrees Fahr. (455 to 540 degrees Cent.) to a brinell hardness of 375 to 444.

The corresponding physical properties are approximately:

Yield point, lbs. sq. in.	170,000 to 195,000
Tensile strength, lbs. sq. in.	190,000 to 215,000
Elongation in 2", per cent	14 to 10
Reduction of area, per cent	40 to 28
Brinell hardness, number	375 to 444

Some of these results on small sections appear graphically in more detail in Fig. 6.

Large forgings also are made of chrome-vanadium steel and for like heat treatment the properties are somewhat higher than those specified for carbon-vanadium steel of similar cross section. Typical specification values are:

	Normalized and tempered
Yield point, lbs. sq. in., min.	60,000
Tensile strength, lbs. sq. in., min.	Not specified
Elongation in 2", per cent, min.	22
Reduction of area, per cent, min.	45

	Quenched and tempered
Yield point, lbs. sq. in., min.	70,000
Tensile strength, lbs. sq. in., min.	100,000
Elongation in 2", per cent, min.	20
Reduction of area, per cent, min.	50

Actual test values are, however, generally in excess of these minima, as noted in the following:

	Normalized
Yield point, lbs. sq. in.	63,000 to 70,000
Tensile strength, lbs. sq. in.	93,000 to 100,000
Elongation in 2", per cent	24 to 28
Reduction of area, per cent	50 to 56

	Heat treated
Yield point, lbs. sq. in.	75,000 to 82,000
Tensile strength, lbs. sq. in.	100,000 to 110,000
Elongation in 2", per cent	22 to 25
Reduction of area, per cent	55 to 62

Vanadium often is used in combination with chromium in steel castings and not only considerably increases the physical properties, but

THIS is the second installment of three comprehensive articles on the development of vanadium-containing steels in the United States, their properties and their present application in the various major industries. Part I dealing with the effects of vanadium upon steels was presented in the Aug. 21 issue of STEEL; the accompanying article considers the properties of vanadium steels and begins a discussion of commercial uses; Part III to appear in the Sept. 4 issue will conclude the applications and set forth the use of vanadium as a process element. These articles are prepared from a paper read before the sixth International Congress of Mining, Metallurgy and Applied Geology in Liege, Belgium, June 22-28. The author, N. Petinot, is assistant to the president, Vanadium Corp. of America, New York.

Table II

Tests of Quaternary Vanadium Steels

Composition per cent	State & section	Heat treatment, degrees Fahr.	Yield pt., lbs. sq. in.	Tensile strength, pounds, sq. in.	Elong. % in 2"	Reduction area, %
Ni V	cast	1825-1850 normalize				
C-0.22 Mn-0.90	6"	1550-1575 normalize	59,000	85,000	29	61
Ni-1.50 V-0.10	square	1100-1125 temper				
Ni V	rolled					
C-0.21 Mn-0.90	1½"	1600 normalize	65,000	85,000	44	45
Ni-1.25 V-0.10	thick				21-8"	
Mn V	cast	1725 normalize				
C-0.30 Mn-1.30	1½"	1550 normalize	53,000	79,000	33	60
V-0.11	square	1400 normalize				
Mo V	forged	1700 normalize				
C-0.45 Mn-0.60	4"	1575 water quench	97,000	130,000	20	63
Mo-0.30 V-0.15	square	850 temper				
Si V	rolled					
C-0.20 Mn-0.65	1¼"	as rolled	72,000	98,000	24-8"	60
Si-1.50 V-0.20	round					
Si V	rolled					
C-0.98 Mn-0.50	1"	1600 oil quench	184,000	206,000	10	21
Si-0.60 V-0.20	round	1000 temper				

also greatly improves the grain structure. Such castings, when of relatively small section, are often heat treated. The heat treated castings usually are water quenched and tempered to the desired hardness. The physical properties are dependent, of course, both upon the amount of alloys and of carbon present and the tempering temperature, and may range as follows, according to the needs of the application.

Yield point, lbs. sq. in.	75,000 to 175,000
Tensile strength, lbs. sq. in.	100,000 to 225,000
Elongation in 2", per cent	25 to 5
Reduction of area, per cent	55 to 10
Brinell hardness, number	200 to 475

Other structural vanadium steels involve combinations with manganese, molybdenum, nickel and silicon, while these are newer alloy steels than those previously described, some excellent results already have been secured as may be seen in the typical values of Fig. 7 and Table II.

For carburized parts a low-nickel chrome-vanadium steel is used extensively, the composition being:

Element	Per cent
Carbon	0.12 to 0.17
Manganese	0.30 to 0.50
Phosphorous, max.	0.04
Sulphur, max.	0.045
Nickel	0.40 to 0.60
Chromium	0.45 to 0.75
Vanadium	0.15 to 0.18

It possesses all of the desirable properties described for the carburizing grades of chrome-vanadium steel combined with high impact strength but it is suited only to small sections generally not in excess of ½-inch.

Vanadium commonly is present in many tool steels. It is a most important constituent of all modern high-speed tool steels, in amounts varying from 0.50 to 2.50 per cent, the percentage of vanadium depending somewhat upon the purpose for which the steel is used. Typical analyses of the two generally used high-speed steels are:

Element	Per cent	Per cent
Carbon	0.65	0.65
Silicon	0.20	0.25
Manganese	0.25	0.25
Tungsten	18.00	14.00
Chromium	4.00	4.00
Vanadium	1.00	2.00

It generally is considered that each addition of 0.30 per cent vanadium adds 10 per cent to the possible cutting speed or doubles the life of a tool working at the same speed and feed. The low-tungsten, high-vanadium type is somewhat more sensitive to variations in heat treatment but when properly treated, shows greatly improved cutting ability especially in severe rough-turning; this heat treatment sensitivity is decreased greatly by substantial additions of cobalt.

Vanadium is also a general constituent in other alloy tool steels,

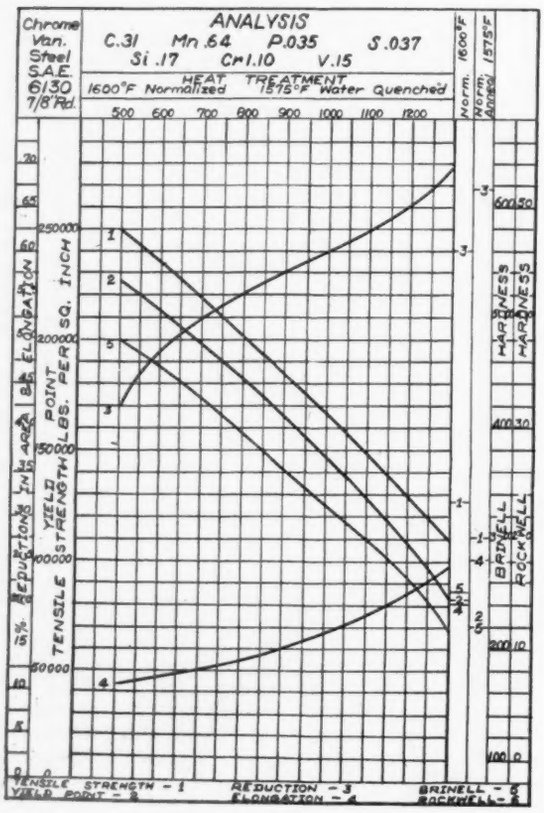
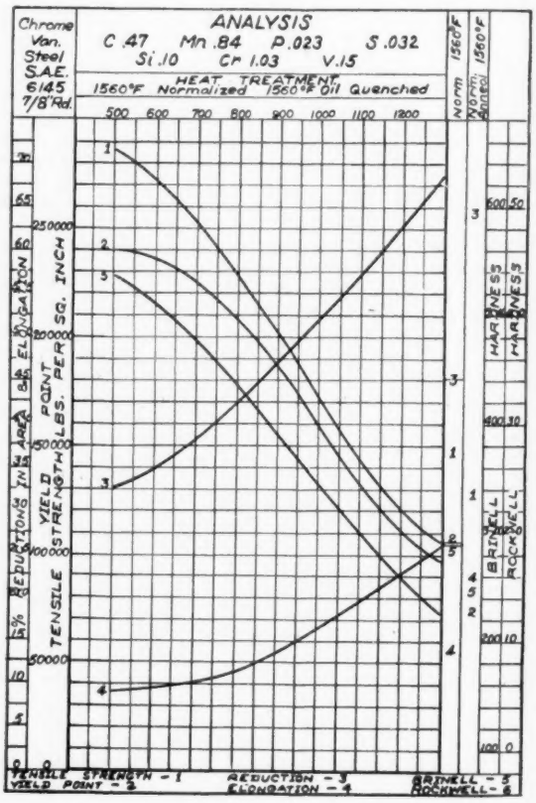


FIG. 6.—Effect of heat treatment on two chrome - vanadium steels of different chemical analyses



notably in those containing chromium that are used for all types of dies—forming, blanking, drawing, hot and cold heading as well as shear blades, punches, etc. Vanadium increases the strength and toughness of these steels and likewise insures greater uniformity in hardening. Table III shows compositions generally used.

Vanadium also is used extensively in straight carbon tool steels for improving the service rendered in all carbon tool steel applications. These carbon-vanadium tool steels have a greater hardening range and can be heated to a higher temperature (as high as 1600 degrees Fahr. or 870 degrees Cent.), without coarsening of the grain. The resultant tools are stronger, tougher, and hold their cutting edges longer. In addition to its use for finishing tools, reamers, etc., the lower carbon ranges are used extensively for chisels, rivet sets, and other pneumatic battering tools; they possess the advantage of tough centers combined with a uniformity in the moderate depth of hardness penetration not obtainable consistently in other steels. Vanadium in carbon-vanadium tool steels ranges from 0.15 to 0.60 per cent.

The marked influence of vanadium on the strength of carbon tool steel is demonstrated in the following compression tests made on identically hardened and tempered 1¼ inch cubes:

Carbon, per cent	Maximum load, Plain carbon	Lbs. sq. in. Vanadium
1.15	172,300	308,800
0.90	203,500	324,700
0.80	282,300	323,800

(*To be concluded in the Sept. 4 issue of* STEEL)

Table III

Vanadium-Containing Tool Steels

(High-Speed Steel Excluded)

Carbon per cent	Manganese per cent	Chromium per cent	Tungsten per cent	Vanadium per cent	Applications
0.85-1.10	1.00-1.60	0.50	0.50	0.25	Dies—nonshrinking, nondeforming
1.00-1.30	0.30	0.50	1.25-2.00	0.20	Finishing tools, taps and milling cutters
0.45-0.55	0.30	1.50	2.00	0.25	Dies—hot working and punches
0.35-0.50	0.30	0.50-1.50	1.50-2.00	0.30	Finishing tools, shear blades
0.40-0.50	0.30	2.75-3.50	8.50-10.00	0.30-0.60	Dies, hot working and die casting, punches, hot shear
0.60-0.80	0.30	0.90		0.20	Dies—cold working and punches, shear blades
0.40-0.50	0.75	1.75-2.00		0.25	Dies—hot working and die casting
			(cobalt)		
2.00-2.20	0.30	12.50	0.70	0.75	Dies—drawing, cold heading, shear blades, etc.
2.00-2.20	0.30	12.50		0.75	Dies—blanking, trimming, forming, extrusion, drawing, cold heading, shear blades
0.45-0.55	0.30	2.00-2.50		0.25	Dies—hot working and die casting
0.70-0.80	0.25	3.50-4.00		0.50-1.00	Dies—hot working, and upsetting
			Molybdenum		
1.40-1.70	0.30	12.00-14.00	0.50-1.00	1.00	Dies—drawing, cold heading, shear blades

Publish Technical Abstracts

Abstracts of scientific and technical publications from the Massachusetts Institute of Technology, Cambridge, Mass., have been published in booklet form by the institute. No. 5 of the series contains material from technical matter presented from July 1 to Dec. 31, 1929, while No. 6 covers the period Jan. 1 to June 30, 1930. The material includes abstracts of doctors' thesis and covers mining and metallurgy, chemistry, biology and public health, physics, economics, mathematics, geology, and aeronautical, chemical, civil and sanitary, electrical, fuel and gas, mechanical, and naval architecture in addition to marine engineering subjects.

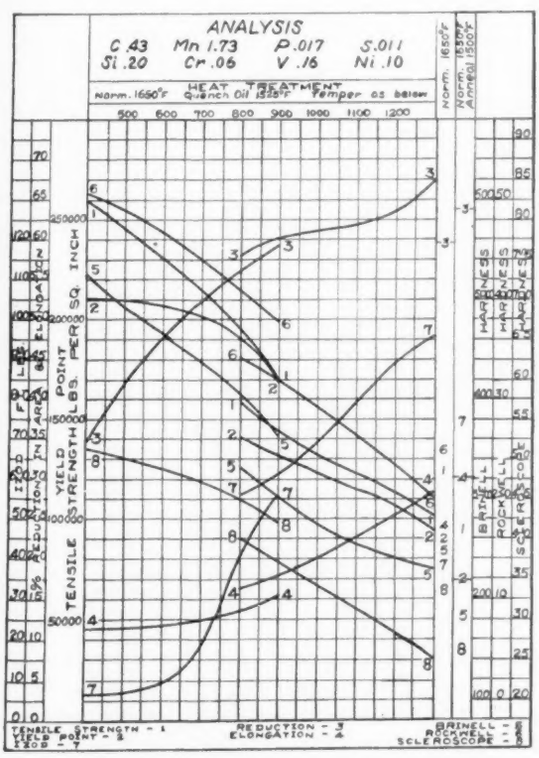
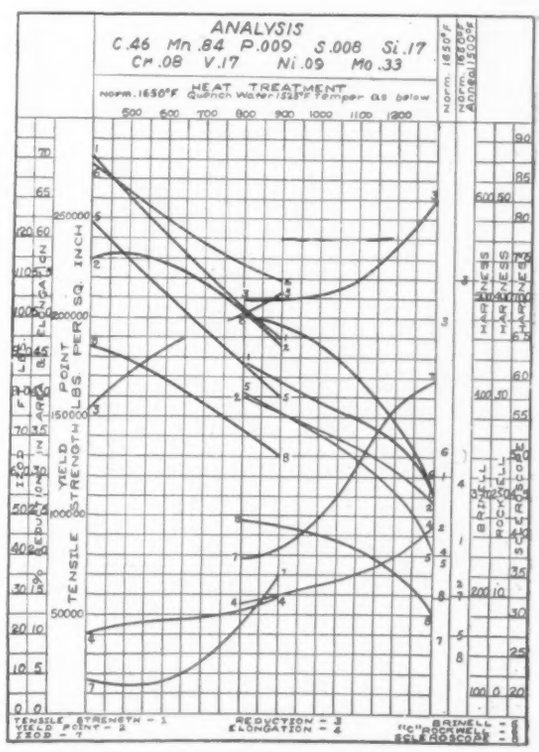
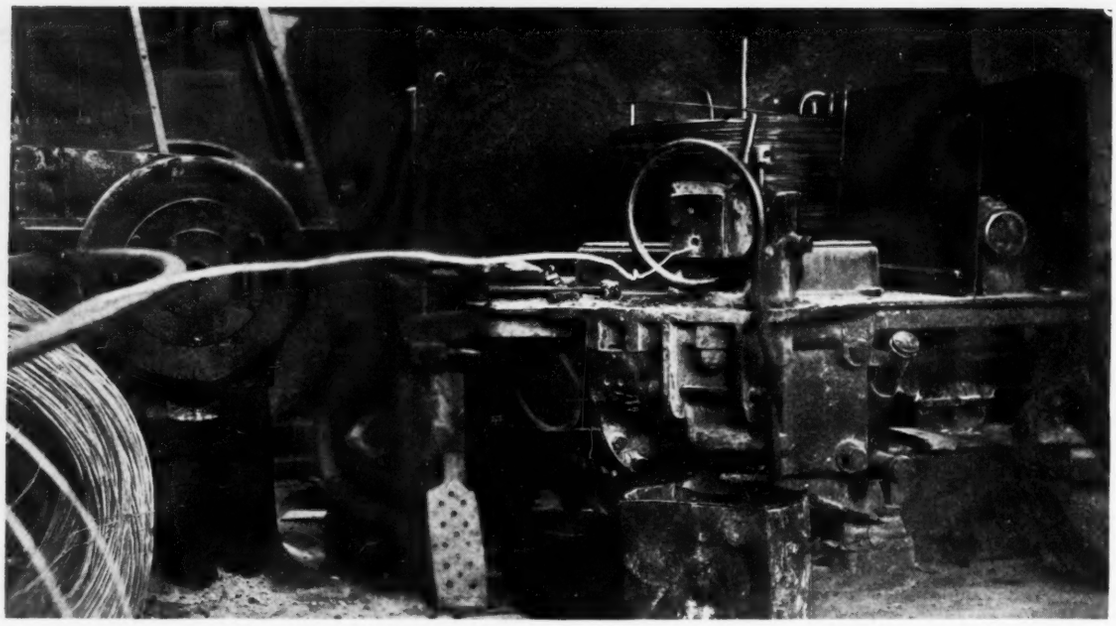


FIG. 7.—Effect of heat treatment on a manganese - vanadium and a molybdenum - vanadium steel. Lower temperature specimens machined before heat treatment and quenched 25 degrees Fahr. lower than indicated. Higher temper specimens 1-inch round


ANALYSIS
C .46 Mn .84 P.009 S.008 Si .17
Cr .08 V .17 Ni .09 Mo .33
HEAT TREATMENT
Norm. 1650°F Quench Water 1550°F Temper as below
TENSILE STRENGTH - 1
YIELD POINT - 2
IZOD - 7
REDUCTION - 3
ELONGATION - 4
BRINELL - 5
ROCKWELL "C" - 6
SCLEROSCOPE - 6



This wire drawing machine was speeded up from 55 to 80 revolutions per minute when tungsten carbide dies were substituted for steel dies

Production Determines Value of Tungsten Carbide Dies

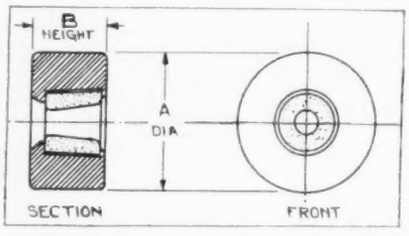
By H. R. SIMONDS
Associate Editor, STEEL

PROBLEMS of die cost and die equipment in a small wire drawing plant differ in many respects from those of a large wire mill. In a small plant certain sizes of wire frequently are not called for and therefore are not produced for considerable periods of time. This means that the die equipment for these sizes is held idle and the die cost must be distributed over a relatively small tonnage of wire. In such cases high initial cost in order to increase the total life of the die is unwarranted. In the same plant production of some sizes may be sufficiently high to make economical the use of the best equipment and dies which give the longest life. An additional advantage of the long-life die often is found in a superior quality.

The Igoe Bros. plant in Newark, N. J., has a capacity of 20 tons of wire a day and is at present operating at this full capacity. The company has been active in the wire-drawing industry for more than 40 years and its experience with dies covers a wide range of design from the early drawplates containing 18 holes down to the new tungsten carbide block with one hole. This company recently made a careful investigation of tungsten carbide dies and found that where production warrants, these dies gives a lower overall cost and with some grades of low carbon steel give a better finish to the wire than when older types of dies are used.

Low Carbon Wire Drawn

The company's principal product is low carbon steel wire of either round or special shaped sections and in a full range of hardness from soft anneal to high temper. The plant is equipped with variable-speed draw blocks and the usual complement of pickling and annealing equipment. Material is transferred from one point to another in the plant on small cars running on narrow-gage tracks. These are supplemented by overhead cranes and trolleys at certain points. The tests of the tungsten carbide dies were made on a 26-inch individual motor-driven block as shown in the illustration above.



Typical cross section of a tungsten carbide die

Three distinct types of dies are used in the plant and each appears to have its special province where its use is advantageous. The earliest type was the so-called English drawplate which still is used extensively. It is made of high-grade forged steel and usually has from 10 to 12 per cent chromium and a small amount of nickel. The plates now being used by the company come from Sheffield, England, where they are made from a Swedish iron base. Each plate has 18 holes and weighs about 21 pounds; cost is approximately $5. For an average grade and size of low-carbon steel wire these plates have a capacity of 500 to 600 pounds of wire per hole.

Peening Is Hand Operation

After all holes have been used the block is placed in a furnace, heated to a glowing cherry red heat and then peened up to give the hole a smaller diameter. This is done by hand by an experienced tool maker. After peening the holes are punched to size with steel punches. This is also a hand operation and requires long experience and a high degree of skill to produce new holes of accurate size and alignment. It is important to have the axis of the new hole coincide with the axis of the tapered portion which is untouched. The peening and punching is continued during the life of the plate until the wear on the tapered portion and the failure of the metal around the holes

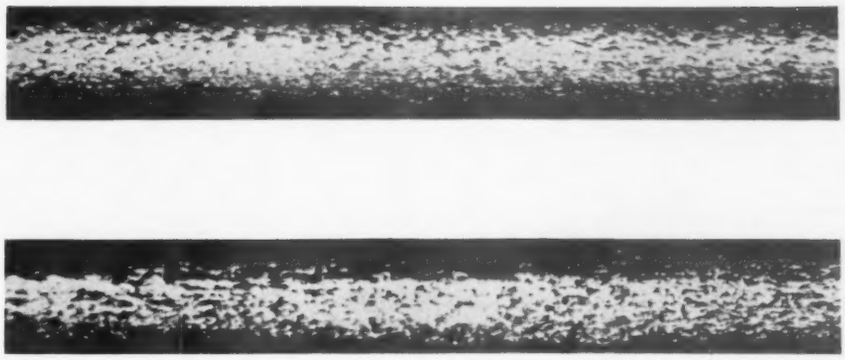
makes it necessary to discard the plate. On the common sizes the company finds that a good plate will last from 15 to 18 months.

The punches used for drawplates may readily be made square or irregular in sections and this feature is an advantage. With cast dies circular holes only can be made by the usual process of reaming. Nevertheless cast draw blocks are coming into more general use. The typical cast block used at the Igoe plant is a high-grade, high-carbon domestic iron, chilled in the mold. The combined carbon in such a block usually amounts to about 3 per cent. Each block usually contains 12 or 15 holes which are drilled to the desired size and taper by the manufacturer. As the holes wear down in use they are reamed to the next larger size. This is a comparatively simple operation. A reamer, often in the form of a three-edged drill, is mounted in a lathe and the block which is to be reamed is then mounted in a special jig on the tailstock. The block then is moved up until the reaming is complete. Each size hole has a separate reamer. Assuming the wire drawing plant to be equipped with the proper fixtures and tools, it then is possible for any ordinary mechanic to do a satisfactory job.

Single-Hole Blocks Used

The third type of die used at the Igoe plant is the single-hole block made of high-carbon steel and lined with a hard material such as tungsten carbide. Dies of this type have a far higher initial cost but, as previously stated, this frequently is justified by their performance. One of the most common operations at the Igoe plant is drawing ¼-inch low-carbon wire rod down to 0.199-inch round in one operation. In this particular instance high production and low cost of operation are important factors. The wire after it leaves the wire drawing department is transferred to another part of the plant where it is cold rolled down to a rectangular section 9/32-inch by 1/16-inch for use in the construction of metal window guards.

Tungsten carbide dies were used for producing the 0.199-inch wire. These dies, each with a single hole, cost $30. Thus 18 holes would cost $540 compared with $5 for 18 holes in the English drawplate. Consequently, a remarkable performance is necessary to offset this high initial cost. With the drawplates the best practice calls for a 26-inch diameter drawing pulley or block operating at a speed of 55 revolutions a minute. With the tungsten carbide die experience has shown that this same machine may be easily speeded up to 80 revolutions a minute, and possibly still higher. One of these dies on the above operation has produced 168,000 pounds of wire with no appreciable wear. Another has produced 204,600 pounds and is ready to be ground to the next larger size.



Illustrating the smoother finish obtained when wire (above) is drawn through tungsten carbide die, compared with wire (below) drawn through steel die

The dies have to be sent out for grinding and the process costs $5 each time a hole is enlarged to the next size. Each hole, starting with 0.199-inch diameter, may be ground to four larger sizes as follows: 0.218, 0.250, 0.281 and 0.300 inches. By the time a die is completely used up it will have cost $20 for regrinding in addition to the $30 initial cost, or a total of $50. However, experience at the Igoe plant indicates that the life of each specially ground hole safely may be assumed to be 200,000 pounds of wire and since there are one original and four reground holes available for use, a total production of 1,000,000 pounds of wire for each die for a $50 die cost appears to be the basis of comparison.

Many Items To Be Considered

Of course, many considerations other than die cost enter into the problem. For instance, it has been found necessary to keep three experienced die men to take care of peening and repunching the drawplates. Also for certain work subsequent operations make it advantageous to have a smooth finish on the wire and, as shown in an accompanying illustration, the tungsten carbide die frequently gives a better finish than the steel drawplate.

In making a comparison many factors must be watched. The successful operation of any die depends upon the speed of drawing, the nature of the lubricant used, the setting of the die and the shape of the hole. The first tungsten carbide dies used at the Igoe plant had too short a taper to the hole and this caused trouble when irregularities in the wire hit against the front edge of the hole with the resultant early destruction of the lining. The practice now is to have the hole long enough so that the wire enters a full third of the length of the hole before its diameter equals that of the internal diameter of the hole. The dies now successfully used have a cross section as shown in the illustration. The taper is 18 per cent.

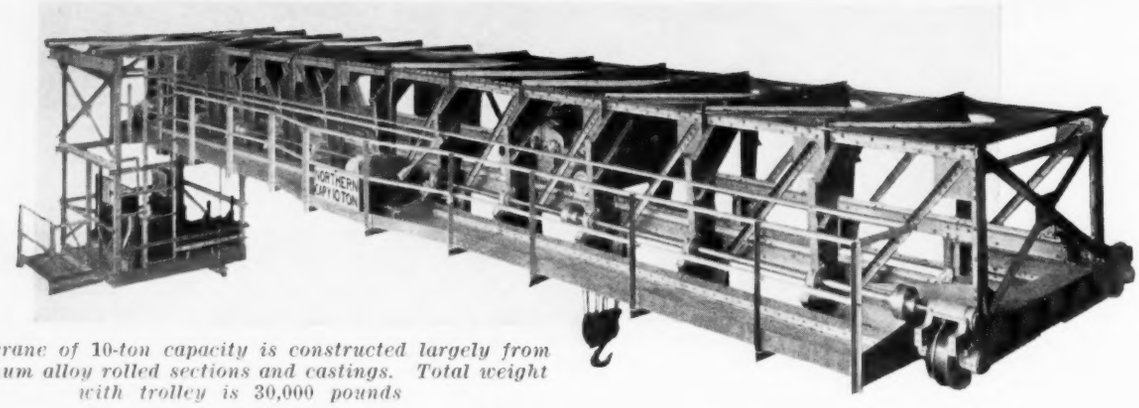
Summing up the various factors entering into the use of tungsten carbide dies for wire drawing operations it is seen that the advantages of high production, longer life, improved finish on the product and a reduction in the amount of labor involved must be weighed against a high initial cost, high grinding costs and the fact that the tungsten carbide dies are of single-hole design while steel and cast iron dies are arranged with multiple holes.

Pipe Research Association Opens Cleveland Office

Co-ordination and expansion of the work of subcommittees of the Cast Iron Pipe Research association is to be the principal object of the standardization and development committee of the association which recently opened offices at 923 Union Trust building, Cleveland, with J. R. Dangler as secretary. Working with the American Standards association, the committee will assist in the development of specifications which will permit the wider use of new cast iron pipe sections, and will promote other development work of the industry. Mr. Dangler, who will direct the activities, was formerly vice president and general manager of the Massillon Iron & Steel Co. and later was assistant to the president of the Central Alloy Steel Co., both of Massillon, O.

Solders Containing Cadmium Have Low Melting Points

Cadmium, which is sometimes called a chemical brother to zinc, is finding use as component of special solders, particularly in those used for sealing cans bearing lithographed labels. The low melting point of cadmium-bearing solders prevents heat discoloration of the labels. Lead-bismuth-tin-cadmium solders can be manufactured to give melting points ranging all the way from 55 to 275 degrees Cent., in spite of the fact that the melting points of none of these constituents are below 327 degrees.



This crane of 10-ton capacity is constructed largely from aluminum alloy rolled sections and castings. Total weight with trolley is 30,000 pounds

Aluminum Alloys Widely Used in Traveling Cranes

SIX unusual overhead traveling cranes, interesting from several standpoints, recently have been built by the Northern Engineering Works, Detroit, for the United States Aluminum Co., Pittsburgh, for the latter's new sheet mills in Alcoa, Tenn. These cranes, including the trolleys, are made almost entirely from aluminum alloy rolled structural sections and aluminum alloy castings.

The crane shown in the accompanying illustrations has a capacity of 10 tons; the span is 76½ feet between truck wheels; and the lift of the hoisting hook is 25 feet. Three 220-volt direct-current mill-type motors drive respectively the hoist, bridge travel and trolley travel and they are provided with full magnetic control, placed in the operator's cab located at one end of the bridge. The hoist operates at a full load speed of 50 feet per minute, and is provided with a 19-horsepower motor. The bridge also has a 19-horsepower motor and fully loaded travels at a speed of 400 feet per minute. The trolley travels at 150 feet per minute, being driven by a 4¼-horsepower motor.

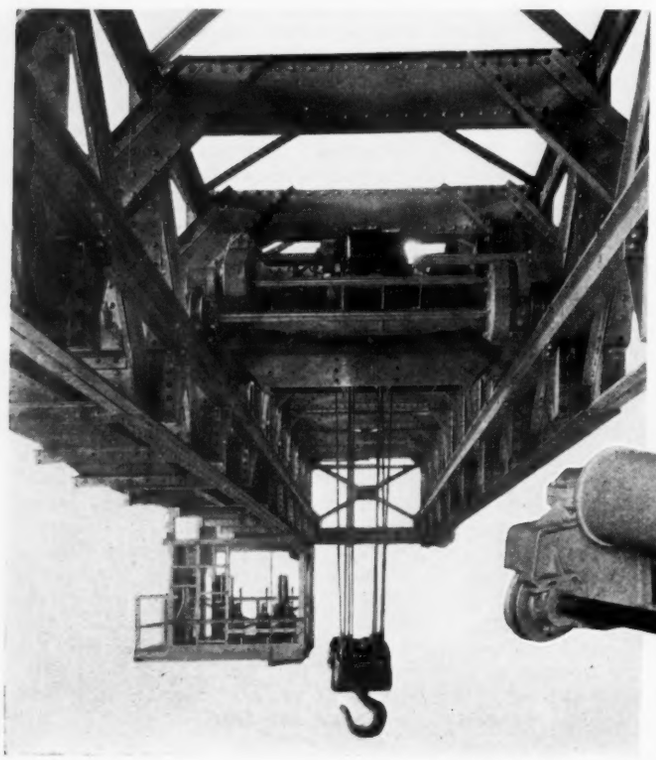
As is to be seen from the illustrations, the crane bridge is of latticed-type girder construction, being the first latticed type bridge designed and built for crane purposes and made entirely from aluminum alloy rolled structural sections. This design not only accomplishes a saving in headroom, which was a factor in this installation, but reduces materially the weight of the structure. The bridge structure is made up of rolled aluminum structural sections, No. 17ST, consisting of channels, angles, plates, rails, rivets, and bolts and nuts.

All rivets are of aluminum, also the T-rail on which the crane trolley runs, including the hook bolts and nuts that secure it to the girders. Furthermore, all electric conduit and fittings are of aluminum and the footwalk which runs the full length of the bridge is made entirely of the metal, including the floor plates.

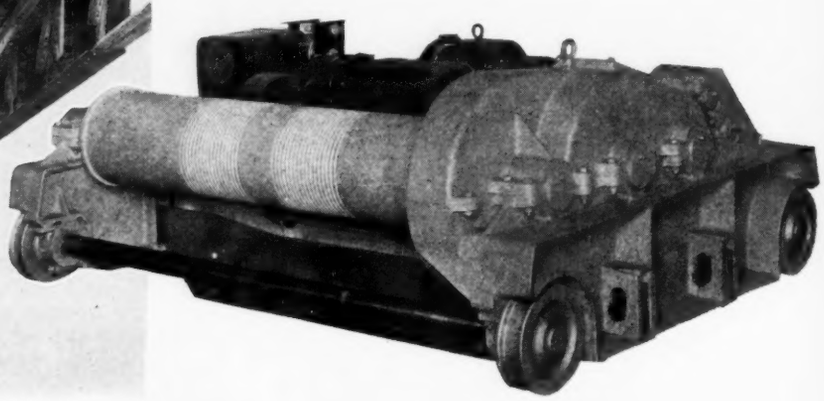
Parts Designed for Strength

The trucks which carry the bridge are aluminum castings, made from No. 195 alloy. All gear housings, gear covers, bearing housings, transmission cases and covers, and lineshaft bearings are of aluminum alloy. The main line or driving shaft extending the full length of the bridge and driving both end trucks was made from aluminum and has a hollow center. This shaft is carried on self-aligning bearing journals, spaced at regular intervals along the bridge girder. The bridge is provided throughout with Hyatt-type roller bearings and with forced lubrication. Aside from the saving in weight because of the material employed, every part and member was designed for minimum weight and maximum effectiveness.

A view of the bridge between the



(Left) — A view of the bridge between the girders showing the unusual construction of the latticed girders. (Below) —The fully-enclosed trolley also uses aluminum for many parts



girders, showing the crane trolley is afforded in one of the illustrations and gives a good idea of the unusual construction. The bridge consists of two latticed-type girders with overhead bracing, the footwalk being attached to the lower chord of the left-hand girder. The operator's cab appears in the background.

Cab Is Well Arranged

The spacious operator's cab is in fact more of a control room than a cab. In a well-ordered arrangement, it contains all the controls, magnetic panels and complete switchboard equipment for the operation of the three motors on the crane. Plenty of free space and floor area are provided for the most efficient and convenient operation of the crane, and excess to all the control equipment. The cab, similar to the rest of the crane, is made up from rolled aluminum structural plates, angles and rivets.

The trolley is a standard Northern type, fully enclosed. As shown in the accompanying illustration, the sides or trucks, which include the lower portion of the gear housings, are made from aluminum alloy castings, also the gear housing covers, bearing housings and the connecting girt between the two trolley frames.

Both girts are of aluminum and permit the live load stresses to be brought directly into the trolley sides. One is a rigid cast aluminum alloy member that connects the two sides and holds the trolley in rigid permanent alignment. It serves only this purpose and to carry the hoist motor; it carries none of the live load. The other is a structural aluminum girt which carries the live load directly into the trolley sides and is free to adjust itself to varying stresses. This feature is a guarantee of permanent alignment for the trolley and its mechanism and a safety feature as well.

Some interesting figures regarding relative weights of this crane employing aluminum and the same crane if built of iron and steel can be given. The weight of only the structural parts of the bridge in aluminum and with the latticed type girders is 16,500 pounds. The same structural parts in steel and with conventional plate-type box girder would have weighed 46,600 pounds. Weight of the bridge complete without trolley is 24,500 pounds; in steel it would have been 68,800 pounds. The trolley unit alone is 5500 pounds; in steel it would have been 8300 pounds. Total net weight of the crane including the trolley is 30,000 pounds against 77,100 pounds it would have required in steel, the saving being 47,100 pounds.

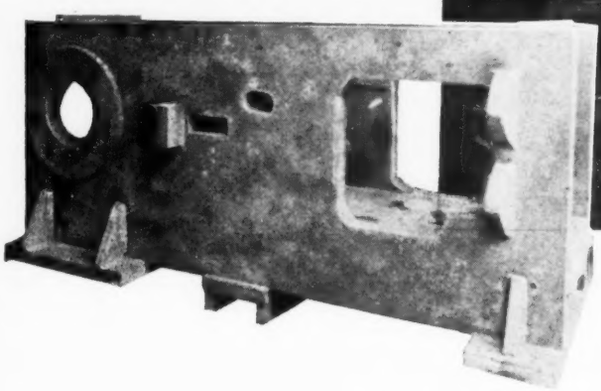
Automatic Stamping Machine Is Fabricated by Arc Welding

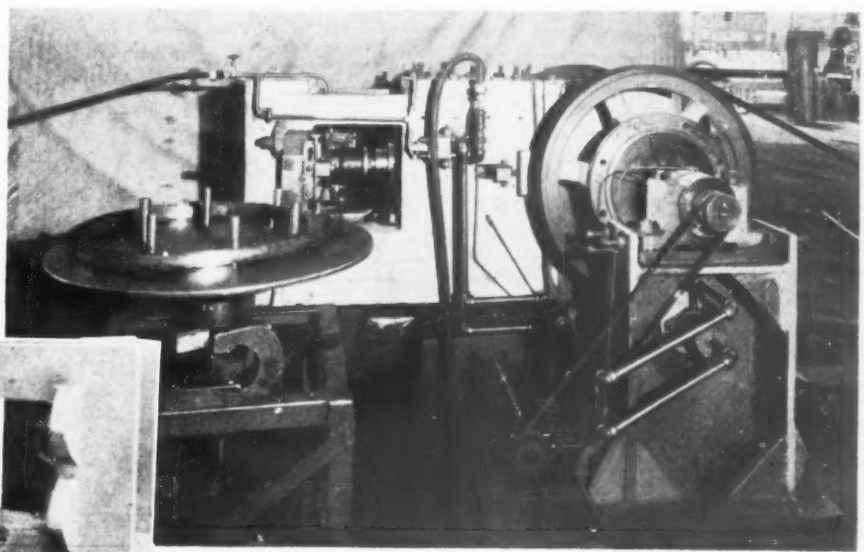
CONDITIONS which impose extremely heavy loads, or unusually rough usage on a machine require that its frame be strong enough to withstand a pressure somewhat greater than that exerted by the machine in ordinary service. This requirement often can be met in the frames of heavy-duty machines by building them of arc-welded steel and in this way placing the correct amount of metal where it is needed.

The automatic stamping machine, shown in the accompanying illustration, is a good example of arc-welded steel construction. This machine was built to order by the Southwark Foundry & Machine Co., Philadelphia, and produces stampings at the rate of 200 per minute from strip steel. Should the machine jam, the slugs would pile up under the dies and subject the frame to extremely heavy loads and shocks. The type of construction illustrated prevents breakage of the frame should such an acci-

The frame of this machine is constructed of 3-inch plate in the main members and 1½-inch plate in brackets and pads. Its weight is 6700 pounds. This frame was fabricated completely by arc welding, using welding equipment manufactured by the Lincoln Electric Co., Cleveland.

In the manufacture of machines to order, arc welding has been known to save time and expense, and at the same time make possible the production of an exceptionally strong and rigid machine. The ability to fuse steel shapes together add the advantage of flexible sizes and sections, and allows the builder to construct just the right size frame with the correct strength in a minimum time.





Three-inch plate is used for the frame of this heavy-duty machine shown at the left. The brackets and pads are arc-welded to these plates using 1½-inch plate in their construction. The automatic stamping machine completely fabricated by welding is shown above

Automotive Engineers Plan Production Meeting

The Society of Automotive Engineers announces plans for a three-day production meeting at the Book-Cadillac hotel, Detroit, beginning Oct. 27. Among the subjects to be covered during this meeting will be; machining aluminum and its alloys, use of tungsten carbide tools, design of material handling systems from user's point of view, wear allowance and tolerance of gages, economic production lots, and the tool engineer's place in mass production. The program is being arranged by J. Geschelin and Prof. John Younger.

Compensating Grinding Costs for Varying Billet Size

By L. C. GRIFFIN

Sales Engineer, Precision Grinding Wheel Co. Inc.

ASK the average superintendent or foreman of a billet grinding room what his grinding costs are and he will give you a figure based on tonnage produced. This figure, he may go on to explain, will vary from one month to another, for different months. Ask him the reason for this variation, and he will list the evils with which we are all familiar, such as poor run of steel, poor grinding wheels, small billets, etc. All of this has a direct bearing on costs to be sure, but the one factor in our estimation that is the most important and to which the least attention is paid is the last—namely, the size of the billet.

Size of Billets Neglected

We have interviewed many foremen, superintendents, managers and officials of a number of large steel companies, producing steel billets, and in some few cases we have had the admission that size of billets plays a part in grinding cost fluctuation. In none of our interviews have we found anyone who has worked out a way to compensate costs when grinding billets that might vary from 1 x 1 inch to 8 x 8 inches. Many a superintendent has been called on the carpet to account for high tonnage costs, who could have explained in a very satisfactory manner, if he had some logical way to compensate for such billet size variation. The purpose of this article is to outline a simple method by which tonnage ground, containing many and varied size of billets, can be reconciled and a fair basis of costs obtained.

Let us assume that for a month, billets are arriving in the grinding room in 8 x 8-inch size. The tonnage costs are low. The goose hangs high. Then comes the second month, and the 8 x 8-inch order has been completed, and a new one started. This new order is an assortment of billets, measuring 2 x 2 inches, 4½ x 4½ inches, 6 x 6 inches, and some 8 x 8 inches. Along toward the end of the month, there is a shortage of grinding wheels and a quick survey shows that grinding costs are going to be high.

In analyzing the predicament of this superintendent, let us assume the first month he was grinding 8 x 8 x 48-inch billets. In an 8 x 8 x 48-inch billet there are 1536 square inches of grinding area. In grinding these 1536 square inches, 3072 cubic inches of steel were passed in billet form, which weighed approximately 867 pounds. When grinding the billet, we assume a cut ⅛-inch deep was taken over the entire grinding area and in so doing, we remove 192 cubic inches of steel which weighs 54.14 pounds. For every square inch ground, we have produced two cubic inches of steel in billet form.

Demonstration Proves Costs

During a previous demonstration it was proven and checked that the grinding wheel cut at the rate of 10 cents per pound of metal removed, which figure included wheel cost, plus labor, plus overhead. This being the case, the grinding cost to produce an 8 x 8 x 48-inch billet was $5.41 or at the rate of $12.49 per ton.

The second month let us assume the size billets ground was 3 x 3 x 48 inches. This billet has 576 square inches of grinding area, a cubical content of 432 cubic inches and weighs 122 pounds. For every square inch ground, we are producing but ¾ of a cubic inch of steel in billet form instead of 2 cubic inches as in the case of the 8 x 8 x 48 inches.

The grinding wheel is still cutting at the rate of 10 cents per pound of metal removed and also we have taken ⅛-inch cut over the entire grinding area. On this billet, we have removed 72 cubic inches weighing 20.3 pounds. This gives us a cost of $2.03 to produce the billet, which is at the rate of $33 per ton. This figure you will allow is enough higher than the $12.49 price per ton obtained when grinding the 8 x 8 x 48 inch to make any superintendent wonder what he is going to tell the boss.

It is readily understood from the above that provided all variables, other than billet sizes, being equal, tonnage costs are in direct proportion to the relation of square area ground to the cubical content of the billet, and not in relation to gross tonnage handled.

In order to compensate for the different billet sizes, we suggest the following simple method:

A billet 4 x 4 of any length has the same number of square inches of grinding area as it has cubic inches in volume. For every square inch ground, you will produce one cubic inch of steel in billet form. The factor, therefore, is 1, so that when a billet of this size is ground, the grinding room should be credited for producing its total weight.

Factor Is Provided

When grinding any other size billet, either larger or smaller, longer or shorter, if you divide the cubical content in cubic inches into the square inches of grinding area, you obtain a factor that if multiplied by the actual weight of the billet, you will have a resultant weight that should be used as a credit to the grinding room instead of the actual weight of the billet. In our illustration of the 8 x 8 and 3 x 3, we should multiply the weight of the 8 x 8 by 0.5, which gives an adjusted weight of 433 pounds. As it costs $5.41 to produce this billet, the cost per ton becomes $24.98 instead of $12.49. In the case of the 3 x 3, the factor being 1.33, the adjusted weight becomes 162 pounds. As it costs $2.03 to produce this billet, the cost per ton is $24.98 instead of $33.

As a matter of illustration, a number of billets of various sizes have been selected, on which cost figures have been obtained, with both adjusted and unadjusted weights. Following is an explanation of the figures given in the accompanying chart:

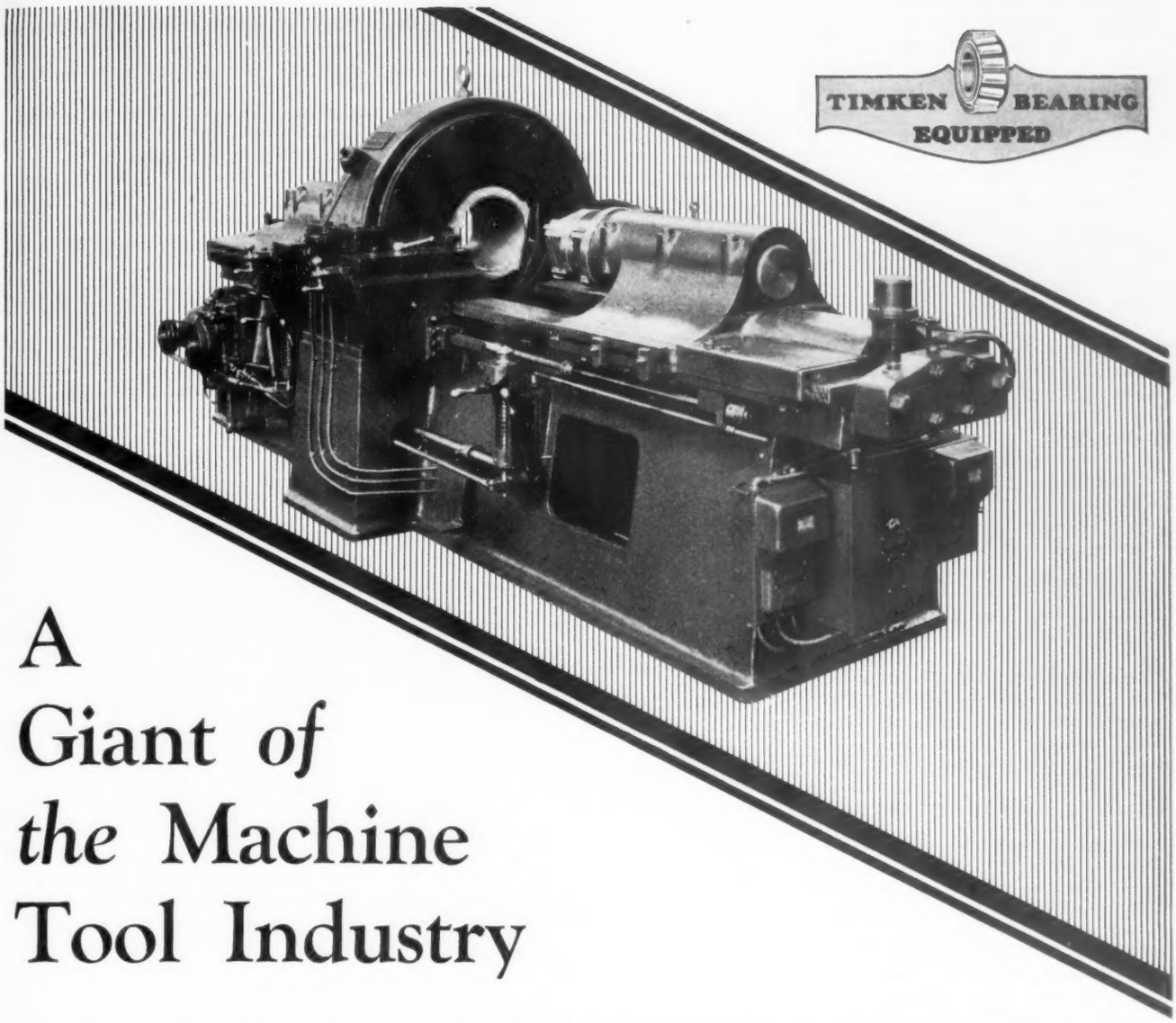
Column 1 gives the size of billet. Note that both square and uneven sizes have been used as illustrations in different lengths.

Column 2 tabulates the square inches of area to be ground which includes four sides, no ends.

Column 3 tabulates the cubical contents in square inches in each billet.

Column 4 tabulates the number of cubic inches of steel produced for every square inch of area ground.

IN the accompanying article is outlined a practical method by which the tonnage ground in the billet grinding departments of steel mills can be figured on a fairer basis. The author is a sales engineer associated with the Precision Grinding Wheel Co. Inc., Philadelphia, and he draws attention to the fact that heretofore but little attention has been paid to the billet size which is an important factor in computing the grinding costs.



A Giant *of the* Machine Tool Industry

The Timken Bearing that carries the 20″ diameter spindle of the Stamets Double End Cylinder-Boring Machine, illustrated above, is said to be the largest ever installed in a machine tool.

This machine bores out the cylinder from both ends at once and simultaneously faces it. The actual boring and facing time on a cast iron cylinder 10″ diameter and 14″ long, is 2½ minutes—a speed previously unheard of for such an operation.

The spindle is really a large rotating chuck in which the cylinder revolves while the cutting tools advance into it.

Chucks of this type requiring such large bearings, have never been satisfactory on plain bearings on account of rapid bearing wear and consequent chatter, and the manufacturer of the Stamets boring machine, William K. Stamets, Pittsburgh, Pa., credits its successful operation, saving in machining time and low operating costs directly to the permanent rigidity made possible by Timken Bearings, and the fact that slight wear which may occur can be quickly and easily compensated for.

All headstock shafts in this machine are also mounted on Timken Bearings, resulting in additional and substantial power and lubricant savings with radically reduced maintenance costs. The Timken Roller Bearing Companay, Canton, Ohio.

TIMKEN *Tapered Roller* **BEARINGS**

Note that although it costs no more to grind one square inch on a 2 x 2 billet than on an 8 x 8, the difference in cubic inches produced in billet form per square inch of grinding area is 1 to 4.

Column 5 tabulates the weight of the billet ground, assuming the average steel weighs 0.283 pound per cubic inch.

Columns 6 and 7 tabulate the amount of steel removed in cubic inches and pounds, assuming a cut ⅛-inch deep is taken all over the billet.

Grinding at 10 Cents a Pound

Column 8 tabulates the cost to remove ⅛-inch from entire ground area, assuming that by actual weight, time and metal removal test, it has been proven that metal can be removed at 10 cents per pound, which includes wheel cost, plus labor plus bonus plus overhead.

Column 9 tabulates the cost per ton to produce each billet, using full weight of the billet. Note that although it costs but 10 cents a pound to remove steel from any of these billets, the cost per ton produced fluctuates from $12.49 to $49.96. For method used in arriving at this figure, refer to the first item on the chart, which is worked out as follows:

$$\frac{\$1.018}{40.75} \times 2000 = \$49.96$$

Total cost to grind billet ($1.018 found in column 8) divided by unadjusted weight of billet in pounds (40.75 pounds found in column 5) equals cost to produce one pound of billets, which when multiplied by 2000 pounds or one ton, equals cost to produce one ton of billets ($49.26 found in column 9).

Column 10 indicates the factor with which the actual weight of the billet should be multiplied by and is obtained by dividing the cubic inches of the billet into the square inches of grinding area. This figure is the reciprocal of that which is found in the fourth column.

Column 11 tabulates the adjusted weight of the billet after the total weight has been multiplied by the factor. This compensates square inches of grinding area with cubic inches of steel produced.

Column 12 tabulates the cost per ton when adjusted weight is used. This figure is obtained in the same manner as that in column 9, using the same cost factor to remove one pound of steel. Note that when adjusted weight is used, the cost per ton of steel produced in billets remains constant.

Therefore, it is demonstrated that provided all factors, such as efficiency of grinding wheel, labor effort, type of steel, condition of steel, etc., remain constant, and the weight adjustment factor described above to be used, the cost to produce a ton of billets will not fluctuate and all sizes should be ground at the same cost per ton produced.

Chrome Steel Doors Guard Wall Street Securities

(*Concluded from Page* 46)

of various sizes. There are four vault doors, such as shown in the accompanying illustration, with two emergency entrances all of which are of solid steel 30 inches thick. One vault door and vestibule will weigh approximately 121,000 pounds.

Each of the emergency entrances, which are used for ventilating purposes, and also the entrance into the vault in the event one of the main entrances refuses to operate, weighs 56,000 pounds. The large main doors weigh approximately 42 tons and a child can operate this door and place it in an open and closed position. This ease of operation is due to the fact that the door is so well balanced that the 42-ton weight can be moved with a mere pressure of the hand. Doors delivered to the job are carried to the building on a 100-ton truck, conveyed on rollers about 75 feet to the elevator shafts, and lowered 69 feet below the street level to be set in position.

In the Bank of Manhattan building circular 30-inch doors of the same materials are used as entrance to one vault, as shown in the accompanying illustration. This door is 90 inches diameter and weighs 78½ tons. The door is right hinged. Two 4-wheel bank locks with offset spindles ground into the door to a liquid-proof fit and one 4-movement 72-hour time lock complete the locking arrangement.

Built in One Piece

The frame is built of a one-piece steel casting U-shaped in section with the two sides or returns connected by webs, the cavity being filled with infusite and special hard chemical compound. Front and jamb return of the casting have a thickness of not less than 1½ inches at any point. The door is made of an integral steel casting not less than 1½ inches thick at any point with the bolt frame cast solid with the door. The cavity is filled with special metals previously stated, infusite making up about two-thirds of the metal employed.

Door accessories include 24 special steel bolts, each 6 inches diameter, crane hinge, pressure system, day gate with key lock, shown in the illustration with circular door ajar, alarm bell, door step, glass interior door, foot plate, metal architrave and foundation. Finished in polished steel are the bolt frame, locking bolts, lock connections, driving wheel, architrave, finish plates on outside and inside of door and frame, jambs of frame and door, glass door frame and crane hinge. The hinge tips, day gate, lever handles, hand wheel, etc., are finished in nickel.

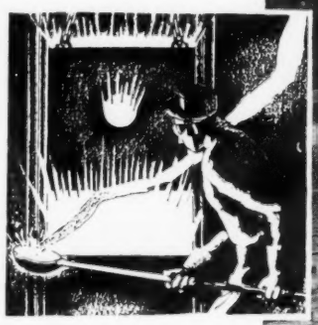
Data Showing Cost Fluctuations When Grinding Billets of Varied Size

1	2	3	4	5	6	7	*8	9	10	11	12
Size of billet	Square inches of grinding area on billet	Cubic inches of steel in billet	Cubic inches of steel produced for each square inch area ground	Weight of billet in pounds (unadjusted)	Cubic inches of steel removed by grinding ⅛" deep	Total weight removed pounds	Cost to remove ⅛" cut all over at 10 cents per pound	Cost per ton using unadjusted weight	Factor cu. in. divided into sq. in.	Adjusted weight equals unadjusted times factor pounds	Cost per ton using adjusted weight
2 x 2 x 36....	288	144	.50	40.75	36.0	10.18	$1.018	$49.96	2.	81.50	$24.98
2 x 2 x 48....	384	192	.50	54.33	48.0	13.58	1.358	49.96	2.	108.66	24.98
2 x 4 x 36....	432	288	.66	81.50	54.0	15.28	1.528	37.48	1.5	122.25	24.98
4 x 4 x 48....	768	768	1.00	217.34	96.0	27.16	2.716	24.98	1.	217.34	24.98
4 x 4 x 72....	1152	1152	1.00	326.01	144.0	40.75	4.075	24.98	1.	326.01	24.98
4 x 5 x 60....	1080	1200	1.11	339.60	135.0	38.20	3.820	22.48	.9	305.64	24.98
6 x 6 x 48....	1152	1728	1.50	489.02	144.0	40.75	4.075	16.66	.667	326.17	24.98
6 x 6 x 72....	1728	2592	1.50	733.53	216.0	61.12	6.112	16.66	.667	489.26	24.98
8 x 8 x 48....	1536	3072	2.00	869.37	192.0	54.33	5.433	12.49	.5	434.68	24.98

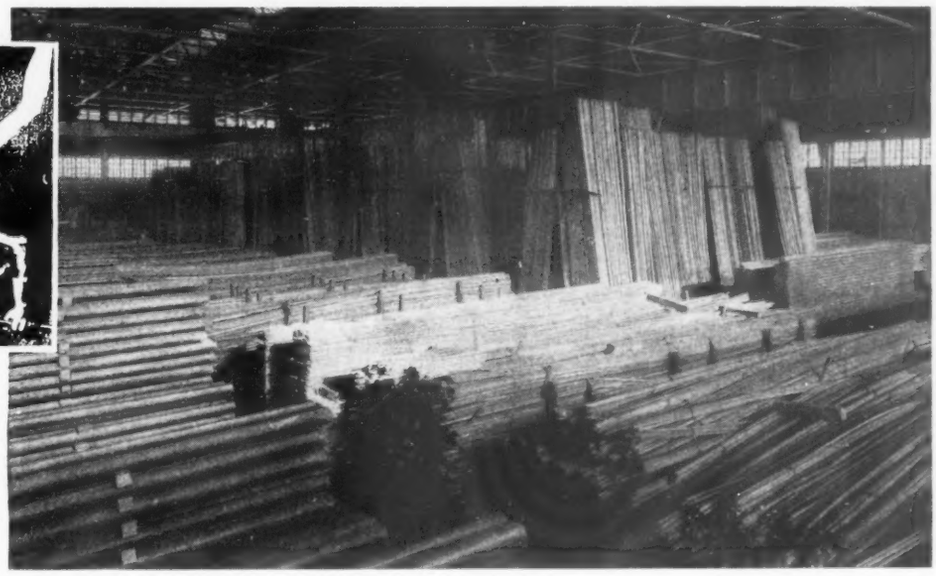
*Note:—The cost of 10 cents per pound is an arbitrary figure selected for convenience of illustration.

FOR EVERY NEED . . . THE RIGHT QUALITY OF STEEL IN A FULL RANGE OF SIZES

IN J&L WAREHOUSES



Because J & L Warehouses form an integral part of the Jones & Laughlin Steel Corporation, you can purchase from them, the same uniformly high quality steel that you would receive on orders to the J & L Mills. Here is pictured the steel bar stocks in the J & L Warehouse at Pittsburgh.



The Word "SERVICE" Means Prompt Delivery of STEEL OF THE QUALITY AND SIZE BEST SUITED TO YOUR NEEDS

PROMPT delivery is only a part of the service you receive on steel ordered from your J & L Warehouse. To every member of the J & L Warehouse organization the word "Service" means also that every order must be filled with steel of known quality, of the grade and in the size best adapted to your requirements.

J & L Warehouses are able to give you this exceptional service because they form an integral part of the Jones & Laughlin Steel Corporation. They draw on J & L mills for their stocks. They have access to all the knowledge of steel and its uses gained by J & L in three-quarters of a century of experience in furnishing iron and steel to a great variety of industries. They can intelligently advise you when you have unusual requirements calling for special analysis steels. Finally, they know—from the experience of J & L—what steel they must stock in each territory served to make good the statement that in J & L Warehouses there is: "For every need . . . the right quality of steel in a full range of sizes."

JONES & LAUGHLIN STEEL CORPORATION

American Iron and Steel Works

JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA

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Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

USES:

Aluminum Alloys

Application of aluminum in petroleum refinery discussed by Stanley Gill, in Chemical and Metallurgical Engineering, August 1930, *p.* 483.

Much experience has shown that all of the commercial aluminum alloys possess a remarkable resistance to corrosion by gases or air containing high concentrations of hydrogen sulphide at temperatures below 250 degrees Fahr. In casing head gasoline plants the most succesful applications probably would be to heat exchangers, to gas lines handling corrosive gas to absorbers, condensers and the like. Light-gage aluminum has proved its value as a sheathing over wooden decks of tanks handling highly corrosive crudes. In addition to the corrosion reduction, the aluminum sheathing may be expected to effect a reduction to evaporation losses.

STEEL 8-28-30

Effects of Alloys

Chemical and physical effects of the use of alloys in cast iron, by R. C. Good, in Transactions and Bulletin of the American Foundrymen's association, August 1930, *p.* 15, 14 *pp.*

In the 20-year period from 1909, when alloys in cast iron were first investigated, until 1929, the production of alloyed irons has risen to approximately 700,000 tons in the United States. The developments in the use of alloys in cast iron, is traced, as is the effects of varying percentages of carbon, silicon, phosphorus, sulphur, manganese, chromium, nickel, vanadium and other elements on the chemical and physical properties of gray iron alloys. Possibilities in the use of the new alloy, zirconium, also are discussed.

STEEL 8-28-30

Pipe Lines

Some aspects of high-pressure natural gas transportation, by R. S. Lord, in Journal of the Western Society of Engineers, August 1930, *p.* 254, 15 *pp.*, 10 *illusts.*

For the last two or three years there has been an extraordinary activity in the promotion and construction of natural gas transportation systems. Projects of a magnitude never before attempted have been carried to successful conclusion and plans are under way for natural gas systems greater than any now existing. In line with these developments and the extensive piping of the gas all over the country, the companies concerned are requiring larger and larger steel pipe. The development of this pipe has been confined principally to the past few years. At one time an 8-inch pipe was considered about the limit. Another problem has been the joining of the pipe sections. Many types of joints have been tried with the victaulic type joint leading the competition until the present ascendency of the welded joint.

STEEL 8-28-30

FABRICATION:

Carboloy Tools

Tungsten carbide tools applied to 300 operations in an automobile truck plant discussed in Machinery, August 1930, *p.* 980, 2¾ *pp.*, 5 *illusts.*

The materials cut are cast iron, malleable iron, gun iron, aluminum bronze, brass, aluminum and a few cases of steel. Of all the operations on which thorough tests have been made, the average increase in production in machining cast iron has been from 30 to 40 per cent, counting floor-to-floor time. In the case of steel drums the production increase has been 17 per cent. Use of the special tools in facing the top of the cylinder bores in the cylinder block afforded a total saving for a given production schedule of $944. It is the impression of the engineers of this company that the largest savings may not be obtained necessarily through excessively high cutting speeds, but rather through the use of more moderate cutting speeds with the accompanying long life tool and the completion of a great many pieces between grinds.

STEEL 8-28-30

Heat Treatment

Heat treatment of high-speed tool steel to lengthen the life of cutting tools, by Herbert M. Boylston, in Black and White, E. F. Houghton & Co., Philadelphia, September 1930, *p.* 22, 4 *pp.*, 2 *illusts.*

The author begins by giving an interesting historical review of the development of alloy steels and their heat treatment, from the pioneer experiments of Robert F. Mushet in 1868. It was not until about 1900, however, that the technique of manufacture and heat treatment of what we now call high-speed steels became in any way established. Frederick W. Taylor and Mansel White, being largely responsible for this better understanding. From that time on, the adoption and development of the new cutting alloys was rapid.

Composition of modern high-speed steels is discussed, forging methods are described, and successful annealing, hardening and tempering methods are described. Sufficient detail is entered into on the subject of heats, time that heats should be held, methods of quenching, etc., to make this article a valuable guide to those engaged in practical heat treating operations.

STEEL 8-28-30

Pickling Metals

Recent developments in pickling operations and equipment requirements discussed by C. A. Crawford, in Inco, Vol. X, *No.* 1, *p.* 14, 3½ *pp.*, 9 *illusts.*

A new alloy known as Ni-resist recently has been introduced for corrosion-resisting castings for pickling equipment. It is a cast iron to which has been added a fixed mixture of nickel, copper and chromium, and is resistant to sulphuric and hydrochloric acids and alkaline solutions. On account of condensed vapor and metallic salts encountered in the pickling process it has been found good practice to provide for washing off the outside of ventilating hoods with a hose each week when the equipment is idle. It also has been found that by painting the outside of hoods with grease every few months the tendence to form encrusted deposits is reduced material-

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ly and the life of the hoods increased. A pickling solution that can be worked hot without undue fuming and which will pickle monel metal, pure nickel and high-nickel white metals includes one part by volume of nitric acid or sodium nitrate, one part sodium chloride and eight parts sulphuric acid, 60-degree Baume, to 90 parts water.

STEEL 8-28-30

Wire Cables

Description of the spinning of four 36-inch cables for the Fort Lee bridge, by E. Warren Bowden, in Engineering News Record, Aug. 14, 1930, p. 242, 7 pp., 13 illusts.

The cables for the new bridge over the Hudson river between Fort Washington park in New York City, and Fort Lee in New Jersey are now rapidly nearing completion. On Aug. 7 the last wire of the total of 105,896 wires was spun, signalizing the placing in a single project of more wire than the sum of that contained in the next seven largest suspension bridges now in existence. The entire bridge is of unusual proportions, its center span of 3500 feet being practically double that of any bridge previously built. The work of spinning the cables involved many interesting problems and many improvements incidental to production on such an unprecedented scale.

The contractor has used new types of footbridges and unusual methods of erection, including an improved design of tramway rope support, power drive and control of reels, an unusual and efficient installation of electric signal and operating equipment. The latter not only permits a close control of the entire spinning operation from a central dispatcher's office but also permits wire adjustments to be made at the towers one-third of a mile away by the observer at midspan. Also by a system of light signals, the progressive stages of wire adjustment are co-ordinated most effectively.

STEEL 8-28-30

Wire Wheels

Simplification resulting from improved annealing operations in the manufacture of wire wheels for automobiles, by W. M. Hepburn, in Industrial Gas, August 1930, p. 23, 3 pp., 5 illusts.

As simplification of manufacture lowers costs, so the trend to wire wheels broadens, for many automobile makers find that this wheel has tangible values not possessed by other types. The Wire Wheel Corp. of America, Buffalo, a division of the Kelsey-Hayes Wheel Corp., Detroit, has a capacity in excess of 40,000 wire wheels per month. Manufacturing operations are divided into the following departments: Inner hub machining; hub shell machining; hub cap machining; rim punching; wheel assembly; enameling; plating; pressed steel; and foundry.

New methods which reduce the number of manufacturing operations are being devised continually, an instance being the hub shell of the Cadillac car, formerly requiring 18 different operations, including four anneals; present practice has reduced this to 12 operations including three anneals. These operations include some severe draws and annealing between the draws must be carried out with extreme care. The annealing furnace used is of the gas-fired counterflow pusher-type and is automatic and continuous both as to operation and temperature control.

STEEL 8-28-30

PRODUCTION:

Blast Furnace Design

Changes in stack construction which effect smoother operation and greater economies, by James P. Dovel, in Blast Furnace and Steel Plant, August, 1930, p. 1285, 2½ pp., 1 illust., 1 table.

A stack redesigned with a thinner inwall lining and with inwall cooling plates and metal top is described in detail. This construction gives an increase in volume above the bosh of 27.4 per cent, an increase in the stockline with resultant decrease in the quantity of flue dust, a bell ratio to stockline which will make active the total area of the furnace, increased thermal efficiency and a permanent inwall lining with the relining charge eliminated in this section of the furnace.

STEEL 8-28-30

Industrial Furnace Design

Recent developments in furnaces for reheating ingots, blooms, slabs, billets and rounds in steel plants, by G. R. McDermott, in Iron and Steel Engineer, June 1930, p. 27, 9 pp., 17 illusts., 1 chart.

Rigid requirements of steel users have brought about revamping of steel mill methods so that exact specifications can be met without curtailing production or increasing production costs. More scientific reheating methods may play a large part in making this possible. The author proceeds to give a detailed account of modern requirements and successful methods of meeting them.

The diagrams serve to make clear the internal arrangements of various modern furnaces and soaking pits, while the halftones illustrate construction details, methods of installation, control systems, etc. The subjects of fuels and furnace operation are touched upon.

STEEL 8-28-30

Railroad Repair Shop

Layout and equipment of the new C & O railroad shops described in detail in American Machinist, Aug. 21, 1930, p. 305, 11 pp., 21 illusts.

Shops were designed for providing the maximum capacity of locomotive output with the least possible detention from service and at a minimum expenditure of labor. Machinery for each kind of work is grouped to avoid all unnecessary handling of parts. Twenty-five divisions or groups are provided in the shop in which equipment has been segregated for handling repairs on related equipment without it being necessary to job out any work in another department. Machine tools installed in the shop are listed in the article according to the type, size, number, location and builder.

STEEL 8-28-30

MISCELLANEOUS:

Manganese Ore

Comprehensive report of the economic setup of the manganese ore industry with special attention to the present Russian situation, in Business Week, Aug. 20, 1930, p. 28, 2 pp.

Manganese production in the United States is an infant industry; it has had a short but checkered career; it faces serious problems; but that it rates more protection than is provided in the Smoot-Hawley tariff is debatable. The American Manganese Producers association has filed charges that Russian manganese ores are being dumped in this country in order to establish gold credits and to ruin the domestic industry. J. Carson Adkerson, president of the association, has told Secretary Mellon that these Russian ores, "sold here at less than production cost," have driven the price down from 40 cents per unit—the average for 5 years ending Jan. 1, 1929—to 25 cents, "resulting in serious damage and even wrecking of the growing domestic manganese industry." Before the war domestic production was negligible; world supplies came from Russia and India.

STEEL 8-28-30

Machine Tools and Shop Equipment

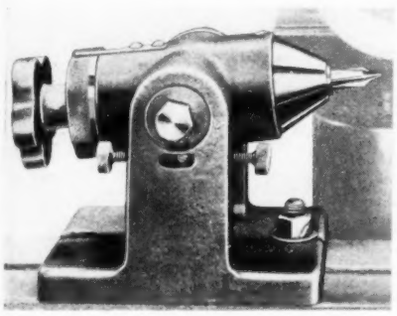
"Without machine tools modern machinery could not be built."

—Joseph W. Roe

Grinding Fixture Handles Tooth Rounding Cutters

City Machine & Tool Works, East Third at June, Dayton, O., has introduced a flute grinding fixture for use with the cutters of a gear tooth rounding machine. The accompanying photograph shows this fixture in operating position on the table of a grinding machine with a cutter about to be fed against the grinding wheel.

The cutter is held in a quick acting collet, and is accurately indexed to each successive flute position by a ratchet spring arrangement. The fixture not only insures that the cutters are properly ground, even by a relatively unskilled operator, but it also insures that a minimum amount of metal is removed at each grinding. Thus cutter performance is kept at its best and cutter life is extended to the maximum.



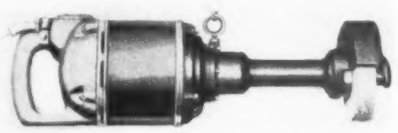
Grinding fixture holds gear-rounding cutters when dressing flutes

◆

Portable Electric Grinders Withstand Heavy Duty

Hisey-Wolf Machine Co., Cincinnati, announces a new line of heavy-duty portable grinders, rated at 1 and 2 horsepower. These grinders, one of which is shown in the accompanying illustration, are equipped both with single-phase motors for lamp socket connection, and with two and three-phase motors for connection to power line circuits. Direct-current motors also can be furnished. The single-phase machines have improved commutating type repulsion induction motors, which do away with the dragging centrifugal switch. They will instantly pick up speed under loads within twice their rated capacity. Their starting current demands are unusually low also, and low voltage has no objectionable effect upon them.

These grinders are designed throughout for heavy duty, motors being rated for continuous duty and all parts being generously proportioned. Ball bearing motors are used and the grinding spindles are carried on tapered roller bearings. The manufacturer points out the advisability of using a 1-horsepower and a 2-horsepower grinder in conjunction, the 10-inch wheels being transferred from the 2-horsepower to the 1-horsepower machine as soon as they are worn down to 8 inches. This induces grinding efficiency by maintaining approximately correct surface speeds, and makes for abrasive wheel economy.



Heavy duty portable grinders have antifriction bearings

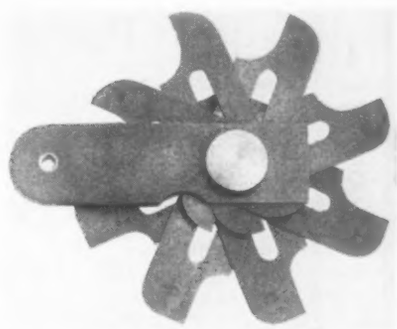
◆

Double-End Radius Blades Are Used in Gages

Brown & Sharpe Mfg. Co., Providence, R. I., has introduced a series of fillet and radius gages of unique design in which concave and convex radii of the same size are combined on the same blade. The blades are slotted so that they will slide along their pivot, thus bringing either end into working position. They are clamped in place by a large thumb screw. Many blades are available at one time, and their length makes them usable in places hard to reach.

Two styles are offered. The one illustrated has a blade form particularly suited to checking fillets and radii in corners or against shoulders. This style is made in two models, one ranging from 1/32 to 17/64-inch by 64ths, and the other from 9/32 to 33/64-inch by 64ths. The other style has radii swung on the center lines of its blades and is especially useful in laying out forming tools and in similar work. This is likewise made in two sizes, one ranging from 1/32 to ¼-inch by 64ths, and the other from 17/64 to ½-inch by 64ths.

The design cuts the usual number of blades one half, which combined with the use of high-grade thin-gage metal makes the gages light, compact and strong.



Concave and convex radii are carried on each gage blade

Straight Column Press Has Unusual Features

Toledo Machine & Tool Co., Toledo, O., announces a new straight column press primarily for heavy forming, flattening and embossing operations, in which are incorporated a number of improvements. The rear view of this press shown in the accompanying illustration reveals the major part of the mechanism.

To insure maximum rigidity, the frame is narrow in proportion to the size of the machine, being only 43 inches between uprights. The crankshaft is of the semieccentric type, and is 13 inches in diameter at the frame bearings and 20 inches in diameter at the crankpin connection. The latter is bronze bushed. The stroke of this shaft is 16 inches and it is supported so as to reduce deflection to a minimum. The slide has an area of 35 inches right to left, by 38 inches front to back. It

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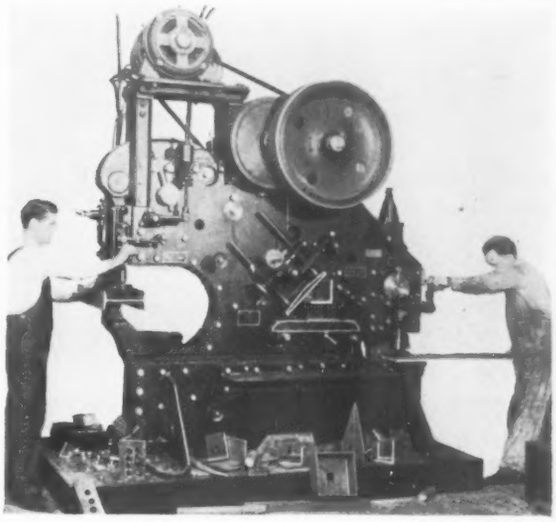
is equipped with a three-bar direct-acting knockout for removing work from the punch. The adjustment is 6 inches, this being effected by a power slide elevator with operating motor mounted on the front of the slide.

Improved Control Mechanism

Gearing, clutch and the control mechanism are arranged compactly. The clutch is of the friction type and is integral with the flywheel. The flywheel is mounted on tapered roller bearings and is the only moving part when the press is not in operation. A clamshell brake is mounted on the opposite side of the press from the clutch, which removes the common objection of the clutch heating up. The hand lever for operating the clutch is fitted with an attachment which allows the press to be stopped or started at will, or by changing the position of a small stud at the bottom of the hand lever, the press can be made to stop automatically at top center. Pressure lubrication is provided from a foot-operated grease gun through individual pipes to each bearing. The press is operated by a 50-horsepower motor which is mounted on the plate shown at the top of the frame. The approximate weight of the machine is 160,000 pounds.



Combined shear and punch permits several operations to be performed at once, will handle large structural shapes, and has improved operating features

Combined Punch and Shear Handles Large Shapes

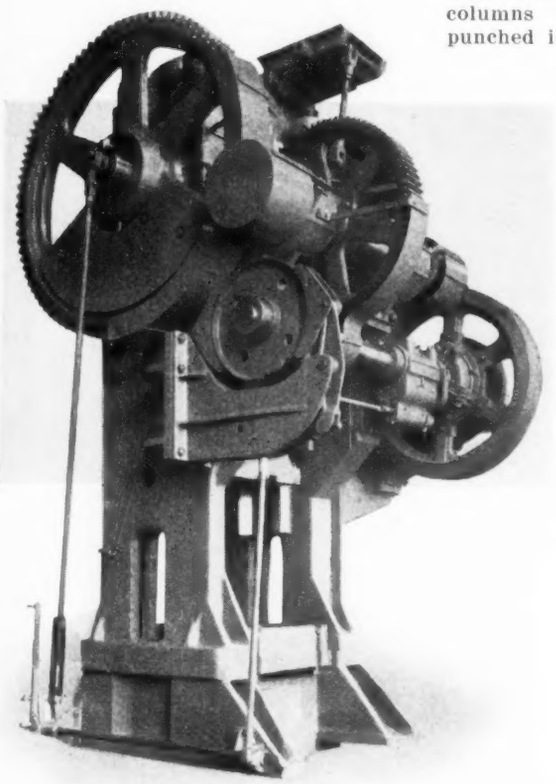
Henry Pels & Co., 90 West street, New York, has added to its line of combination shears and punches a new machine adapted to the requirements of larger structural work. A view of the unit is shown in the accompanying illustration. The punch end of the machine has a capacity up to 1-inch holes through 1-inch steel. The depth of the throat is 24 inches and its height is such that Bethlehem beams up to 30-inch and H-columns up to 14-inch can be punched in webs and flanges. The machine will even punch webs and flanges of Carnegie CB sections up to 36 inches in height and 16-inch width of flange.

Strength and rigidity are assured by a heavy double-plate frame. A full-floating punch head allows the punch to be set on the center mark by means of a hand lever, where it can be held until the operator is ready to punch the hole, at which time the punch will penetrate the steel without first going up. The punch will also "float" over the work, that is it will go up and down over the work touching it lightly at each stroke, leaving both hands of the operator free to center the work.

The angle shear has a new double spindle holddown. The plate shear has a crank and worm operated holddown, and rollers in the horizontal plate splitting channel to facilitate feeding of large and heavy plate. The angle cutter has capacity for 6 x 6 x $\frac{5}{8}$-inch angles, cutting square, and 4 x 4 x $\frac{1}{2}$ inch angles, cutting bevel.

A special set of die blocks and punch holders adapted to the high throat are available. These cover the entire range of the machine in punching structural shapes, with the least possible number of changes of set-up. With this set the rare changes necessary are confined to light-weight parts which are easy to handle.

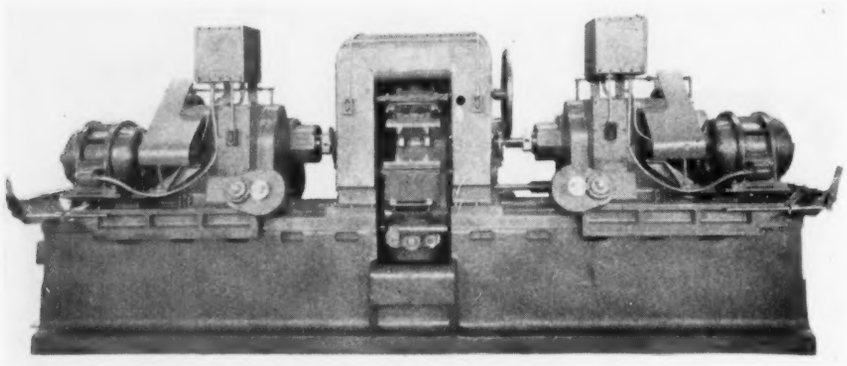
The machine requires 7½' horsepower, it is 88 inches long x 51 inches wide x 82 inches high, and its approximate weight is 8250 pounds.



This straight column press has power and strength to perform unusually heavy forming, flattening and embossing operations at a high rate of production

Duplex Hydraulic Machine Bores and Taps Valves

Baker Bros. Inc., Toledo, O., have introduced a line of duplex hydraulic feed machines particularly suited to



Such work as boring and tapping of valve bodies is done at high speed by this hydraulically controlled duplex machine

such work as the boring and tapping of valve bodies. The main frame of these machines is a single box-type casting, so designed to permit the mounting of various kinds of heads and fixtures to suit the work in hand. The heads are driven by independent motors through V belts. Provision is made for adjusting the spindles so that the tools can be set for size. Adaptors are furnished in the fixture plate for each different size of fitting.

The machine is fully automatic, the main spindle drive being electrically controlled so that when the operator presses a push button the main drives in each end start simultaneously. The heads then feed through the work, the taps collapse, the heads back out, and the motors stop to await the beginning of the next cycle.

Details of Operation

To secure the desired tapping lead from the hydraulic feed mechanism, the heads are fed against a retarding cam, a separate cam being furnished for each end. These cams are each made in two pieces so that changes in lead can be made quickly, a change requiring about 10 minutes. Ball bearings are used throughout the machine. Each head has an independent hydraulic feed pump of the gear type, these pumps being driven by direct-connected motors and each having a separate oil reservoir. The fixture has an attachment which automatically brushes the chips to the rear, and out of the machine.

The machine illustrated has a two-spindle head at each end, and a three-position indexing fixture. It will bore and tap valve bodies of either cast iron or steel from 1¼ up to 4 inches. Single spindle heads can be furnished. Each head is driven by a 15-horsepower motor and each hydraulic pump by a 3-horsepower motor. The weight of the machine shown is about 20 tons.

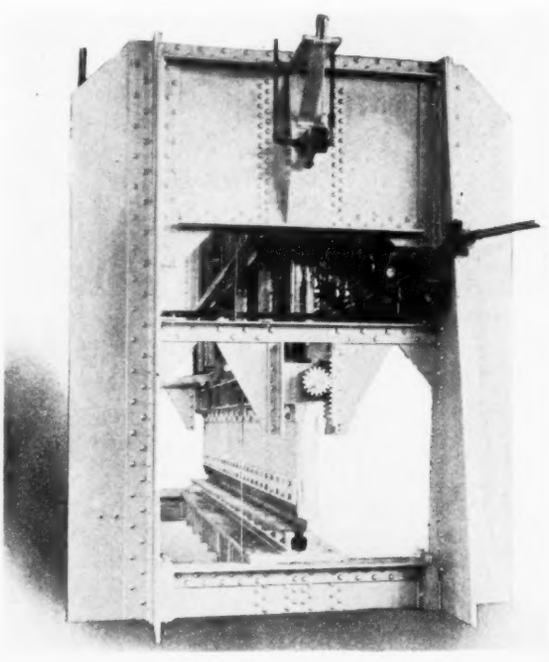
Large Plate Brake Press Has Hydraulic Power

Duff Patents Co. Inc., Pittsburgh, has designed an unusually large and powerful plate brake press, featuring structural steel construction and being hydraulically driven. The end housings, one of which appears prominently in the accompanying illustration, are made from solid plates of steel 1-inch thick, and are of open design so that material can be fed in and withdrawn through the ends of the press. The machine is equipped with five hydraulic cylinders of 200 tons capacity each, these being supported between the heavy steel girders which connect the two end housings.

The hydraulic pressure available is 3000 pounds per square inch, and with all cylinders operating together a total pressure of 1000 tons is available. This is capable of bending cold a ⅝-inch plate 25 feet long to any angle in one stroke in less than 1 minute. Each cylinder can also be worked independently, so that, with independent dies and several operators, work requiring several operations can be done at one passage through the press.

Primarily, however, the press is intended for bending long plates of heavy gage. On work of this type, the male die is ordinarily in the nature of a knife edge to form a square corner, but provisions are made for the attaching of dies of any shape or radius. According to the builder, the finished work is absolutely true in form.

The illustration does not give an adequate idea of the size of this press. It occupies floor space, 14 x 30 feet, stands 14 feet 10 inches above the floor, extends 2 feet 6 inches below the floor, and weighs about 160,000 pounds.



Unique application of hydraulic power is made in this big brake press, which will bend cold a ⅝-inch steel plate 25 feet long to any angle in less than 1 minute

Gear Testing Machine Gives Check on Cutting

Gleason Works, Rochester, N. Y., has designed a machine for testing the running qualities of straight and spiral bevel gears whose shafts intersect at 90 degrees. The essential working parts of this machine are shown in the acompanying illustration, the box-shaped pedestal on which it is mounted being cut away.

The machine is a precision instrument and at the same time it is of sturdy, heavily-ribbed construction to withstand load tests. The spindles on which the gears are mounted are car-

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In introducing me to your friend 'Arc Welding' you added, 'He can do his best work for us with the 'Stable-Arc' welder, because Lincoln is the admitted leader of the field.'

Now I know that there must be merit in other machines . . . so how on earth can Lincoln keep ahead?"

"Easy, Pop—

By S-P-E-E-D.

They've kept ahead by using all their head on arc welding. No part of the headwork is dissipated on other subjects. They're specialists—in a highly specialized field. Everyone from the front carpet to the steel platform in the rear (arc-welded, by the way) works for the *cause* of arc welding and for the *effect* of making the 'Stable-Arc' the best welder.

In manual welders, in automatics and in their 'Fleetweld' electrode Lincoln has the lead in speed—and transfers this speed to the welding problems of 'Stable-Arc' users.

And in saying this I don't belittle any other welders. They nearly all have merit, as you say—which keeps the Lincoln people on their toes all the time to maintain their lead.

In short, a rabbit never is so fast as when there's something behind it."

The Lincoln "Stable-Arc" Welder

— welds easier
— makes better welds
— permits greater output because of the steady uniform arc throughout entire welding range, which is the result of:

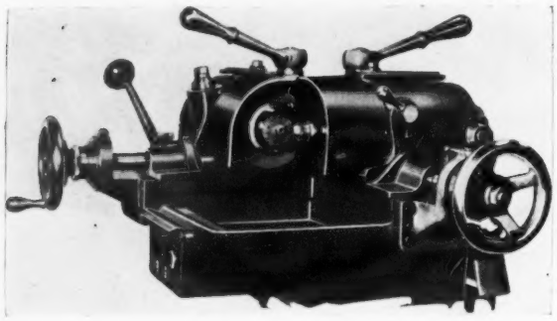
Variable voltage design
Laminated magnetic circuit
Separately-excited generator field
Double control of welding heat
All steel construction

No other welder has all these features.

The Lincoln Electric Co., Dept. No. 20-8, Cleveland, O.

W-155

"Stable-Arc" LINCOLN WELDER



Testing machine allows quick, accurate checking of bevel gears of straight and spiral types, and determines allowances for heat treating

ried on matched ball bearings arranged in pairs with sufficient initial load to eliminate radial and axial deflection. The bearings are protected by labyrinth seals. The taper boxes of the heat-treated spindle noses are ground after the spindles are in place, insuring absolute concentricity. The ways on the frame are of generous width and narrow guides give close alignment.

The pinion head is power driven in either direction, and has a push button control. It is adjustable horizontally on the frame by handwheel and lead screw with a dial graduated in 0.001 inches.

The driven, or gear, spindle is mounted in an eccentric which permits its adjustment either slightly above or below the axis of the pinion spindle. By this the operator is able to determine the amount of change in the adjustment of the gear cutting machine required to produce gears with correct tooth bearings. It also can be used to compensate for wear in the ways of the testing machine itself. The eccentric is clamped by lock bolts. The entire gear head is adjustable on the frame at right angles to the pinion head by means of handwheel and lead screw. Both heads are clamped to the frame front and rear by separate clamps, exerting equal tension and actuated by a single lever.

Capabilities of Machine

The machine will test bevel gears up to 3 inches in diameter, by running them together in pairs or with a reference gear. It is useful in checking cutting machine setup, for testing hardened gears for tooth bearing and quietness, and as a final test on lapped gears. In the case of heat-treated gears, it determines setting of cutting machine needed to compensate for changes during the heat treatment. Load tests are made possible by a brake which can be manually operated or set for fixed amount of load.

The drive is by 1½-horsepower motor through a V-belt, motor and control being built into the column of the machine. Spindle speed is 3000 and 4500 revolutions per minute. Net weight is 550 pounds.

Gasoline-Electric Welder Is a Portable Unit

Lincoln Electric Co., Coit road and Kirby avenue, Cleveland, announces a new gas engine-driven arc welder with a rating of 400 amperes and a current range up to 500 amperes. One of the units mounted on wheels for field work, is shown in the accompanying illustration. This welder meets the growing demand for a powerful, portable machine capable of handling heavy electrodes on structural work, oil and gas lines, ship building and repair, etc.

The outfit is of the variable-voltage single-operator type, and runs at 1500 mechanisms of all controls are housed mechanism of all controls are housed in a ventilated steel cabinet, hand regulators and switches being mounted on a panel which forms one side of the cabinet. This panel carries the rheostat, diverter switch, volt-ammeter and wingnut terminals for cables, giving unified control. The control cabinet is conveniently mounted directly over the generator. The commutator of the welding generator and the exciter are provided with covers which protect them against damage by falling objects.

The generator is driven by a 6-cylinder engine with an S. A. E. rating of 33.75 and a brake horse power of 55 at 1500 revolutions per minute. An automatic throttle control permits the engine to idle at approximately half speed when the arc is not going; upon striking the arc, the engine immediately comes up to full speed. A time delay keeps the engine running at full speed in case the arc is momentarily broken. This interval is long enough to permit the operator to change electrodes, etc., without having the speed affected, but the machine will automatically slow down during longer interludes such as moving to a new location.

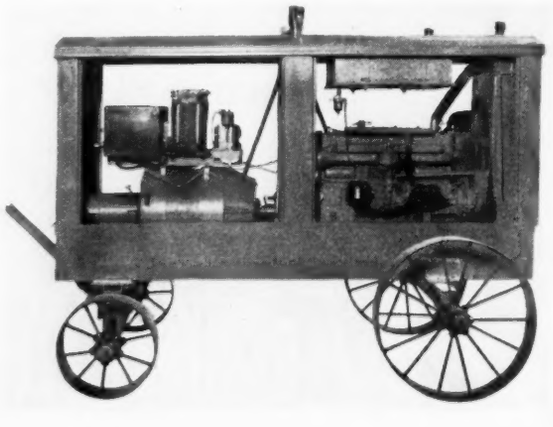
The unit is provided with a metal cover with removable metal sides all of which interlock so that the use of one padlock will prevent tampering. Wheels, which are optional, are of 6-inch tread, and a "fifth wheel" allows short turning. The overall dimensions, exclusive of wheels, are 104 x 32 x 58 inches and the weight is approximately 3500 pounds.

Reports Machinery Demand In Latin America

The demand for United States built machinery is steadily increasing in Mexico, and in Latin America generally, according to the newspaper El Porvenir (Monterrey, Mexico). The success which is already attending the factory production of shoes, cotton goods, hats, etc., in several Latin American countries is a stimulus to new machinery-using industries, and this trend is believed to forcast the gradual disappearance of the small, individually owned "handicraft" industries in these lines. With ample raw materials available and electric power being developed, the field for industrial machinery is rapidly being extended—in many cases under government patronage.

About 197 pounds of coal was required in 1920 to move 1000 tons of freight 1 mile, as compared with 125 pounds in 1929.

New arc welding unit meets demand for portable outfit capable of handling heavy electrodes on structural work, oil and gas lines, ship building, etc.



Steel Production Starts Upward

Operations Gain Several Points After Slip of Preceding Week—Some Prices Decline—Consumers Seek Forward Delivery at Present Prices

CONFLICTING crosscurrents render appraisal of the steel market difficult but the underlying situation indicates near approach of much better conditions. Concrete favorable market indications are difficult to isolate but various surrounding factors make for the belief improvement is started or about to get under way.

Operations have been increased somewhat the past week after declining last week, the Steel corporation advancing its ingot production to 66 per cent of theoretical capacity, compared with 62 per cent a week ago and 62½ to 63 per cent two weeks ago. Independent steel producers have increased production from 49 per cent to 51 per cent of capacity. For the entire industry the average operation was about 58 per cent, compared with 54½ per cent the preceding week and 56 per cent two weeks ago.

Numerous steel consumers are inquiring from producers for tonnages to be shipped over long periods at present prices, evidently regarded as the bottom. Mills are wary of commitments and offers have been made for the remainder of the year at current levels, with an increase of $2 per ton for first quarter. At the same time prices of finished steel have yielded slightly, shapes and plates being available at $1 per ton under former levels and the upper member of the spread on bars disappearing.

As an indication that effects of the drought will not be as severe as had been feared, tin canmakers are taking unusually large tonnages to meet demand from canners. Last week saw the shipment of what probably is the largest tonnage in history of tin plate. Most of this was on rush orders. Mills had established reserves to meet this need and shipments were made promptly on demand. Some canmakers have anticipated contract requirements to meet needs of canners.

Exports of iron and steel products show heavy falling off, in returns from Washington, and this factor is sufficient to account for part of present lack of mill activity. Not since 1925 has so little tonnage gone abroad. Added to domestic dullness this accents the situation. Oriental dullness is indicated by exports of steel scrap to Japan at only a quarter of the usual tonnage in July.

Activity on the Pacific Coast has been increasing and the past week has been the most active of the summer, with several good tonnages placed and others near placing. Construction is the largest outlet for steel in that area.

Steel pipe activity is indicated by placing of 35,000 tons of electrically welded gas line pipe with a Youngstown, O., producer. Some additional pipe for new lines is approaching the stage of contracting.

Steel scrap scarcity is causing an advance in quotations here and there, although the general list is unchanged. Sensitiveness to every sign of activity indicates this market is ready to move on any general increase in requirements.

Automotive users of steel are not in the market actively but their needs are being felt in somewhat larger buying in cold-finished steel and strip. Stocks in hands of automobile builders are at a minimum and all orders call for immediate delivery to prevent interruption of manufacturing.

Railroads are out of the market for rails and cars, awaiting better earning conditions. A Chicago railmaker has just entered 25,000 tons of rails on its books as unfilled tonnage, the order having been placed tentatively several weeks ago. Most rail backlogs have been fairly well cleared and further buying this year is problematical.

Structural awards this week are 35,000 tons, the decline from the unusually high record of the past two weeks being expected. Projects under consideration are sufficient to yield considerable tonnage for future weeks, though probably not at the midsummer rate.

Because of reductions on plates, shapes and galvanized sheets STEEL's market composite reduces 12 cents this week, from $33 to $32.88.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (Aug. 27, 1930)	**$32.88**
Last week (Aug. 20, 1930)	**33.00**
One month ago (July, 1930)	**33.21**
Three months ago (May, 1930)	**33.73**
One year ago (Aug. 1929)	**36.54**
Ten years ago (Aug. 1920)	**68.87**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Aug. 28, 1930	July, 1930	May, 1930	Aug., 1929
PIG IRON				
Bessemer, del, Pittsburgh	$20.26	20.46	20.76	20.76
Basic, valley	18.00	18.20	18.50	18.50
Basic, eastern del. eastern Pa.	18.25	18.00	18.75	19.85
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	19.76
No. 2 foundry, Chicago	17.50	17.90	19.00	20.00
*Southern No. 2, Birmingham	14.00	14.00	14.00	14.00
**No. 2X, Virginia Furnace	18.25	18.25	18.25	20.00
**No. 2X, Eastern del. Phila.	19.76	20.26	20.26	22.26
Malleable, valley	18.50	18.70	19.00	19.00
Malleable, Chicago	17.50	17.90	19.00	20.00
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	18.63	18.83	19.13	19.13
Ferromanganese, del. Pittsburgh	103.79	103.79	103.79	109.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12 to $13, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.50	2.50	2.55	2.75
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	$31.00	31.00	32.20	35.00
*Sheet, bars, open-hearts, Pitts.	31.00	31.00	32.20	35.00
Billets, open-hearth, Pittsburgh	31.00	31.00	32.20	35.00
Wire rods, Pittsburgh	36.00	36.00	36.40	42.00

	Aug. 28, 1930	July, 1930	May, 1930	Aug., 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.65	1.70	1.75	1.95
Steel bars, Chicago	1.75	1.80	1.85	2.05
Steel bars, Philadelphia	1.94	1.94	2.04	2.27
Iron bars, Chicago	1.75	1.90	1.90	2.05
Shapes, Pittsburgh	1.60	1.65	1.75	1.95
Shapes, Philadelphia	1.66½	1.67	1.77	2.06
Shapes, Chicago	1.75	1.75	1.85	2.05
Tank plates, Pittsburgh	1.60	1.65	1.75	1.95
Tank plates, Philadelphia	1.80½	1.86	1.91	2.15
Tank plates, Chicago	1.75	1.75	1.85	2.05
Sheets, blue anl., No. 13, Pitts.	2.15	2.15	2.15	2.20
Sheets, black, No. 24, Pitts.	2.45	2.55	2.55	2.85
Sheets, gal., No. 24, Pittsburgh	3.00	3.15	3.25	3.55
Sheets, black, No. 24, Chicago	2.60	2.70	2.70	3.10
Sheets, blue anl., No. 13, Chicago	2.30	2.30	2.35	2.50
Sheets, galvanized, No. 24, Chi.	3.20	3.35	3.35	3.80
Plain wire, Pittsburgh	2.30	2.30	2.35	2.50
Wire nails, Pittsburgh	2.05	2.10	2.15	2.60
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.35
SCRAP				
Heavy melting steel, Pitts.	15.50	14.90	15.40	18.90
Heavy melting steel, eastern Pa.	12.50	12.50	13.38	16.75
Heavy melting steel, Chicago	12.00	12.00	12.55	15.05
No. 1 wrought, eastern Pa.	14.25	14.25	15.38	16.25
No. 1 wrought, Chicago	11.25	11.25	12.70	15.40
Rails for rolling, Chicago	14.50	14.50	14.85	17.75

Sheets

Market Shows Signs of Early Improvement—Full Finished Extras Reduced in Some Sales

SHEET PRICES, PAGE 69

Pittsburgh—Signs of improved business are beginning to appear in the sheet market. Demand is changed only slightly but this change is for the better and consumers are showing more interest in future requirements. Automotive tonnage is slightly heavier although still seasonally light, and aggregate business shows only a slight gain over activity of the preceding several weeks. Requirements of other leading sheet consumers are fairly steady with an improvement in some lines looked for next month. Some inquiry is being received for extended shipments of sheets based on current prices, but producers are not interested in such business for shipment beyond the end of this quarter. Prices remain fairly steady, with black sheets 2.45c; galvanized is 3.00c to 3.10c with the lower figure generally applied to jobbers; blue annealed sheets are 2.15c with plates 1.90c to 2.00c. Long ternes are easier, however, at 3.45c to 3.55c, off $2 a ton. Mill operations are unchanged at 45 to 50 per cent.

Youngstown, O.—Independent sheet mills in this district are operating at 43 per cent against 38 per cent last week. On Saturday night recently a pickling crew in a local mill was called back to work to load sheets for an important automotive interest. If the shipment had not been made the auto builder's plant would have had to close Monday, showing how little stock consumers are carrying. Autobody material still is in slow demand, and blue annealed has tapered off. Black sheets hold at 2.45c to 2.55c, Pittsburgh; blue annealed at 2.00c and 2.15c; autobody at 3.60c, and galvanized at 3.10c.

New York—Sheet prices are easier and leading sellers report trading is less active than at the beginning of the month. Galvanized sheets are holding at 3.05c to 3.10c, Pittsburgh, and black sheets at 2.40c to 2.45c, the lower prices becoming more prevalent. Blue annealed show greater softness, plates now 1.90c, Pittsburgh, and sheets at 2.05c.

Cleveland—Sheet orders are no heavier, but the present week possesses prospects, as a local body plant is to release steel for approximately 97,000 new model Chevrolet "six" cars. This plant of the Fisher Body Co. also is to make assemblies which can be used interchangeably on other General Motors cars. Enameling stock is low on account of slack operations among stove manufacturers and electric refrigerator makers. Some of the latter, however, like General Electric Co., are starting up this week after a two-weeks' shutdown. Autobody sheets are available at 3.50c, and metal furniture at 3.60c, as against recent minimums of 3.60c and 3.70c, Pittsburgh. Full finished sheet extras have been reduced $2 to $5 a ton in some instances. Black sheets are quoted as low as 2.35c, Pittsburgh.

Chicago—Sheet operations are better this week at 70 to 75 per cent. There is little to feature the market. The galvanized price holds at 3.10c, mill, and prices on black and blue annealed continue unchanged.

Philadelphia—Sheet buying still lacks volume, and prices while unchanged are easy. Galvanized are 3.05c, base, Pittsburgh, and black 2.45c, subject to occasional concessions. Blue annealed plates are 1.90c to 2.00c, and sheets 2.05c to 2.15c, although the lower figures are more representative.

St. Louis—Sheet producers and distributors report a fair demand, mainly in small lots for prompt shipment. Seasonal requirements in the South are being covered. Prices are unchanged.

Cincinnati—Sheet mills report improvement in general demand, following seasonal trends, but orders from the automotive and radio fields are disappointing.

Buffalo—Sheet prices are steadier, and there seems to be a little better tone.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.45c
Detroit, delivered	2.76½c to 2.81½c
Philadelphia, delivered	2.74c
Gary, Indiana Harbor	2.55c
Chicago, delivered	2.60c
Birmingham, base	2.70c
St. Louis, del.	1.80½c

TIN MILL BLACK, NO. 28

Pittsburgh, base	2.70c to 2.80c
Gary, base	2.90c to 3.00c

GALVANIZED NO. 24

Pittsburgh, base	3.00c to 3.10c
Philadelphia, delivered	3.29c to 3.34c
Gary Indiana Harbor	3.15c to 3.20c
Chicago, delivered	3.20c to 3.25c
Birmingham base	3.25c to 3.30c
St. Louis, del.	3.45½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.15c
Chicago, district mills	2.25c
Chicago, delivered	2.30c
St. Louis, delivered	2.50½c
Philadelphia, delivered	2.34c to 2.44c
Birmingham	2.30c

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base	1.90c to 2.00c
Chicago, district mills	2.10c
Chicago, delivered	2.15c
Philadelphia, delivered	2.19c to 2.29c
St. Louis, delivered	2.35½c
Birmingham	2.15c

AUTOMOBILE NO. 20

Pittsburgh, base	3.60c
Detroit, delivered	3.86½c

FURNITURE NO. 24

Pittsburgh	3.70c

Tin and Terne Plate

Prices per 100-pound box Pittsburgh

Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, 24, primes .... 3.45c to 3.55c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

Standard wire nails	$2.05 and 2.15
Cement coated nails	2.05 and 2.15
Galvanized nails	4.05 and 4.15

(Per pound)

Polished staples	2.50c and 2.60c
Galvanized staples	2.75c and 2.85c
Barbed wire, gal.	2.70c and 2.80c
Annealed fence wire	2.20c and 2.30c
Galvanized wire	2.65c and 2.75c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.30c
Spring wire	3.30c
Wire, delivered Detroit	2.53½c
Nails, delivered Detroit	$2.38½

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts-Cleve.	2.75c
Struc. c.l., Chicago	2.85c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Steel Plates

Pittsburgh, base	1.60c to 1.65c
Philadelphia, del.	1.80½c
New York, del.	1.88c
Boston, del.	2.05c
Chicago, base	1.75c to 1.80c
Cleveland, delivered	1.78½c to 1.88½c
Lackawanna, N. Y., base	1.80c
Birmingham, base	1.85c to 1.90c
Coatesville, Pa., base	1.70c
Pacific Coast, c.i.f.	2.15c to 2.25c
St. Louis, del.	2.00½c
Detroit, del.	1.91½c to 1.96½c

Structural Shapes

Pittsburgh, base	1.60c to 1.65c
Philadelphia, del.	1.66½c to 1.70½c
New York, del.	1.75½c to 1.85½c
Boston, del.	1.88½c to 1.98½c
Chicago, base	1.75c to 1.80c
Cleveland, delivered	1.83½c to 1.88½c
Lackawanna, N. Y.	1.80c
Birmingham, base	1.85c to 1.90c
Pacific Coast, c.i.f.	2.25c
Detroit, del.	1.91½c to 1.96½c

Bars

SOFT STEEL

Pitsburgh, base	1.65c
Chicago, base	1.75c to 1.85c
Birmingham, base	1.85c to 1.90c
Lackawanna, N. Y., base	1.85c
Pacific Coast, c.i.f.	2.35c
Cleve. base, local mills	1.70c to 1.75c
Philadelphia, del.	1.94c
New York, delivered	1.98c
Boston, delivered	2.05c
Detroit, del.	1.91¼c
Pitsburgh, cold finish	1.80c
Pittsburgh, forg. qual.	1.90c

RAIL, STEEL

Chicago Heights	1.65c
Eastern mills	1.65c

IRON

Chicago, base	1.75c to 1.85c
New York, delivered	1.93c to 1.98c
Philadelphia, delivered	1.94c to 1.99c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c to 2.00c
Stock lengths, mill	1.65c to 1.75c
Chi. billet, over 500 tons	1.85c
30 to 200 tons	2.00c
Under 30 tons	2.45c to 2.85c
Chi., rail steel, over 30 tons	1.50c
Under 30 tons	2.10c to 2.50c
Philadelphia, cut lengths	2.04c to 2.09c

Cold-Finished Steel

Bars, Pitts., Chi., Buff.	2.10c
Cleveland	2.00c to 2.10c
Do. delivered, Detroit	2.20c
Shafting (turned, polished)	
Pitts., Buffalo	2.10c
Do. (turn., ground) mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets 35c; plates 31c; bars 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80-1.10 Cr.	0.45
2300	1.50	5100 Chr. spring.	0.20
2500	2.25	6100 Bars	1.20
3100	0.55	6100 Spring	0.95
3200	1.35	Chr., Ni., Van.	1.50
3300	3.80	Carbon Van.	0.95
3400	3.20	9250 (flats)	0.25
4100 .25-.40 Mo.	0.70	9250 (rds., sq.)	0.50
4600 .20-.30 Mo.			

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.75c
Hot strip 6 1/16 to 24-in., Pitts.	1.65c
Hot strip, bands 6 in. and under, Chicago	1.90c
Do. 6 1/16 to 24 in.	1.80c
Cooperage hoop, Pitts.	1.90c to 2.00c
Do. Chicago	2.00c to 2.10c
Cold rolled strip., Pitts., Cleve., 3 tons, over	2.35c to 2.45c
Worcester, 3 tons, over	2.60c to 2.70c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes boat, barge, Pitts.	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	75 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930 lists.

CARRIAGE BOLTS

All sizes, cut thread	73 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Eagle list	73 off

MACHINE BOLTS

All sizes cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	73 off
Tire bolts	60, 10 and 10 off

Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 10, 5, 2½ off in bulk.

Rolled thread machine bolts, ⅝ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished	73 off

***HEXAGON CAP SCREWS**

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85-10 off

***SQUARE HEAD SET SCREWS**

Milled	85-5 off
Upset 1 in. and smaller	80-10-5 off

*Discounts dated Jan. 23, 1930.

Cut Nails, Chain, Piling

Cut nails, c.l., mills	2.45c
Do, less carloads	2.55c
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	2.00c to 2.10c

Bars

Price Settles to 1.65c, Pittsburgh—Small Lot Buying Rules —Total Somewhat Better

BAR PRICES, PAGE 69

Chicago—Sales and specifications are a trifle heavier this week and are well distributed among implement, road machinery, automobile makers and auto supply manufacturers. Tractors and farm implements are in good demand for export, though domestic takings are rather quiet. Deliveries are being made at two to three weeks. Soft steel bars remain at 1.75c, mills, and bar iron continues at 1.75c to 1.85c, Chicago.

New York—Steel bars continue in light demand, with the market unchanged at 1.65c, Pittsburgh. Common iron bars are 1.60c to 1.65c.

Philadelphia—Steel bars are unchanged at 1.65c, Pittsburgh, subject to occasional shading. Demand is featureless.

Pittsburgh — Demand for steel bars is steady but tonnage leaves considerable to be desired. Some improvement is in prospect for September and there are indications that consumers are showing more interest in future requirements. The market is steady at 1.65c for carload lots but the 1.75c price now is restricted to mixed carloads.

Cleveland—Bar tonnage is turning upward slightly. The price, however, tends downward. Local mills now name 1.65c, Cleveland, for outside shipment and 1.70c, Cleveland, for local delivery, $1 a ton reduction. Outside mills name 1.70c, Cleveland, equalizing the freight at points they can reach in competition with Cleveland mills. One seller sold a few hundred tons in lots of 50 tons orders last week, indicative of the character of today's buying.

Rail Steel Bar Body Extends Research Work

Members of the Rail Steel Bar association met in Hamilton, Ont., Aug. 7-8 for their thirty-ninth general session. The greatest attention was given to a review of methods that have been established to maintain and improve the quality of rail steel bars produced by associated mills. This work has been conducted by the works managers' division. To supplement the work and more directly relate production to marketing a committee on metallurgy and production was appointed, composed of the chief metallurgists of the mills, who will act under direct supervision of the executive board and in co-operation with the works managers. They will correlate all production data, investigate possibilities of raw materials and act as a consulting board in extending mill improvement.

Several papers were presented dealing with the internal economics of the rail steel industry. Members of the association now identify their reinforcing bars as having a definite standard of quality and are listed as "willing to certify" in the bureau of standard's list of standard commodities and their producers. The plant of the Burlington Steel Co. Ltd. was inspected.

Otis Declares Dividends

Otis steel co., Cleveland, has declared regular quarterly dividends of 62½ cents a share on common stock and $1.75 a share on prior preferred. Both are payable Oct. 1 to stockholders of record Sept. 19.

Plates

Pipe and Tank Requirements Continue Fairly Active—Shipwork in Eastern Yards Quieter

PLATE PRICES, PAGE 69

Chicago—Plates going into line pipe tonnages still are being taken in large volume by the leading Milwaukee fabricator. Demand is active for oil tank material, and manufacturers of the latter report they have more work than in some months. About 10,000 tons are pending. During the week 2500 tons were placed for southwestern consumption. New orders are running at almost the rate of last week. Plate mill operations are high. Quotations on the basis of 1.75c, mills.

New York—Plates are unchanged at 1.70c, Coatesville, with buying quiet. Pipe and tank work is the quietest in some time, and little is developing in shipbuilding. Bids are to be opened soon on two to four boats for W. R. Grace & Co., requiring approximately 12,000 to 24,000 tons of steel, depending upon the number to be placed. Of the steel required 65 to 70 per cent will be plates. However, there is little likelihood of action for some time. On all boats financed under the Jones-White act it is the rule to obtain bids first to establish the cost of the work. There are at least six large boats awaiting final action on loans, including among the latest on which bids have gone in two boats for the Eastern Steamship Lines, Inc. The Newport News Shipbuilding & Dry Dock Co. is low bidder on these boats. Railroad buying continues a small factor. Eastern mills are operating 50 to 60 per cent.

Philadelphia—Plates are quiet, at 1.70c, base, Coatesville, subject to the usual differentials to preferred customers. Bids are to be opened in Washington Sept. 12 on coast guard cutter No. 54, requiring 500 tons of plates and 300 tons of shapes.

Pittsburgh — Plate demand is steady and in fair volume considering the quietness in freight car building. Activity in line pipe production, however, offsets this deficiency. Tank work is active and fabricators continue fair buyers. Although 1.65c, Pittsburgh, is considered the general market, 1.60c is applied on larger lots.

Cleveland — Plate fabricators report a heavy inquiry for products made from plates and engineering departments are exceedingly busy. Orders, however, still remain scarce. While 1.65c, Pittsburgh, still is quoted in numerous instances, 1.60c is available. Numerous orders have been received from bucket and shovel manufacturers, many of whom have had a better year to date than in 1929.

Contracts Placed

1000 tons, tanks for Procter & Gamble Co. plant, Long Beach, Calif.; to Western Pipe & Steel Co., Los Angeles.

100 tons, boiler, White River Lumber Co., Enumclaw, Wash., to Puget Sound Machinery Depot, Seattle.

Coke Continues To Decline

By-product coke output dropped to 3,770,426 tons in July from 3,953,846 tons in June. The reduction in beehive coke was from 261,600 tons in June to 214,600 tons in July. Daily output of by-product coke was the lowest since December, 1927. Daily output of beehive coke

in July was reduced to the lowest point since the bureau of mines began compiling monthly records.

	By-product coke	Beehive coke	Total coke
1929			
July	4,613,723	600,200	5,213,923
7 mos.	28,829,823	1,910,900	30,740,723
1930			
July	3,770,426	214,600	3,985,026
7 mos.....	31,275,723	3,957,600	35,233,323

Steel Furniture in Slump

Shipments of steel furniture and shelving in July, as reported to the department of commerce, reached a lower level than in June, which was the lowest figure in 1930 or 1929. The figure was below that of July, 1928, and July, 1927. Comparisons follow:

	Business Group New orders	Business Group Shipments	Shelving New orders	Shelving Shipments
	(In Dollars, 000 omitted)			
1929				
July	2,590	2,658	939	867
(7 mos.)	19,998	19,845	7,279	6,888
Aug.	2,417	2,482	931	889
Sept.	2,294	2,313	879	842
Oct.	2,842	2,983	927	979
Nov.	2,900	2,631	801	859
Dec.	2,583	2,781	735	856
(year)	34,036	34,038	11,554	11,322
1930				
Jan.	2,886	2,890	724	674
Feb.	2,370	2,549	758	682
March	2,627	2,726	839	812
April	2,523	2,427	796	814
May	2,310	2,342	725	751
June	2,005	2,123	698	705
July*	2,249	1,807	601	609
(7 mos)	16,973	16,866	5,144	5,050

*Preliminary.

Steel Castings Again Drop

Orders for commercial steel castings booked in July fell below those of June, the fourth decline in succession. Production also fell off from June and previous months. Department of commerce figures are as follows:

1929	Total bookings	Per cent of capacity	Total production	Per cent of capacity
July	103,356	71	118,100	81
(7 mos.)..	827,290	81	787,594	77
Aug.	101,777	70	121,238	83
Sept.	86,584	59	106,995	73
Oct.	136,208	94	120,937	83
Nov.	97,888	67	110,297	76
Dec.	90,287	62	106,569	73
(year)	1,340,034	77	1,335,631	78
1930				
Jan.	101,728	70	109,296	76
Feb.	104,727	80	107,897	75
March	122,658	85	113,737	79
April	93,200	65	110,903	77
May	91,307	63	105,242	73
June*	61,358	43	90,985	63
July	57,923	40	79,029	55
7 mos. ..	642,901	64	717,089	71

*Revised. **Preliminary.

Railroads

Car Inquiries Negligible—Orders Few—Rails Released—New Inquiries Not Showing Up

TRACK MATERIAL PRICES, PAGE 69

Chicago—Railroads generally are maintaining running repairs, but neglecting heavy repair work. Car buying is slack and car shops feel the first half year's impetus should be cleared up by next month. Fresh inquiries, while conspicuously absent, undoubtedly are made up in many cases, but await releases. Illinois Central, Northern Pacific as well as Great Northern, are in this category. Railroads are releasing some tonnages on rail contracts. Great Northern will not purchase 9000 tons of rails until grading has been adequately completed. Equipment sellers do not expect railroads to purchase until earnings show some upward turn. The crop situation should be cleared up by October.

New York—Pending action by Lehigh & New England on 305 freight cars, the eastern car market, continues quiet. Fresh inquiry is negligible. Locomotive demand also is slow.

Pittsburgh—The market for railroad material is marking time and little new business is expected until after Sept. 1. Annual rail orders are not due for a number of weeks but some early equipment purchases are indicated. Current specifications and shipments are steady but slow.

Birmingham, Ala.—Rail and car shops here await new business with few prospects. Pullman Car Co. Shops and the rail mill of the Tennessee Coal, Iron & Railroad Co. continue at about 50 per cent capacity.

Car Orders Placed

American Smelting & Refining Co., 75 25-ton gondolas to Koppel Industrial Car & Equipment Co., Koppel, Pa.

Illinois Steel Co., 105 ingot cars to American Car & Foundry Co., Chicago.

Rail Orders Placed

Delaware, Lackawanna & Western, 2500 tons of steel rails, October delivery, to Bethlehem Steel Co., Bethlehem, Pa.

Seattle Street Railway Co., Seattle, 500 gross tons, 60 and 80-pound open-hearth steel rails, to Columbia Steel Co.

Car Orders Pending

New York Central, 50 milk cars, construction contemplated in Merchants' Dispatch shops.

New York, New Haven & Hartford, two steel underframes for wire train work cars.

Standard Oil Co. of Indiana, seven 50-ton gondolas.

Beaver-Niles Canal Route Survey Is Started

United States engineers have started a survey of the Beaver-Niles canal route which is one section of the proposed canal from the Ohio river to Lake Erie. Congress will be asked for an appropriation to begin construction if approval is given by the engineers. A start on the first link, it is believed in the Pittsburgh district, would be followed by approval of the remainder of the route from Niles, O., to a point on Lake Erie near Ashtabula.

The Niles-Beaver canal will give the Shenango and Mahoning valleys a waterway to the Ohio and place them on a competitive basis with the Pittsburgh district in seeking business in the South and Southwest. A cheaper rate on coal shipments to valley mills also will be effected by the canal.

If and when the canal is projected through to the lake Pittsburgh mills would benefit from reduced freight on iron ore and western Pennsylvania coal producers would be able to regain some of the lost coal markets in the Northwest by virtue of the lower shipping charges to lake points in Ohio.

A survey of the Erie-Ohio canal route was made by United States engineers some time ago and although it was reported as the best of several such projects it was termed as "economically unfeasible." Champions of the canal, however, claim the canal would be a paying venture because of the two-way traffic in coal and iron ore.

Gray Iron Business Lower

Production by members of the Gray Iron institute in July was 10.1 per cent lower than in June. New business was 4.2 per cent less; unfilled orders 7.8 per cent less, and materials received 15.2 per cent less than in June. Production in July was 63.6 per cent of "normal," or average monthly output during the last three calendar years. Sixty members reported the business outlook poor; 51 fair; 16 bad, and three good.

Structural Shapes

Lettings Still Numerous—Aggregate Lower—6000-ton Nurses' Home Job Let in East—Much Work Projected but Actual Inquiries Fewer —Price 1.60c to 1.65c

STRUCTURAL SHAPE PRICES, PAGE 69

New York—Two subway sections to be advertised early next month call for close to 15,000 tons. Three sections are now being figured for October award. Resumption of subway activity comes at a time when there appears to be a slump in new inquiry for fabricated steel. Prices on fabricated material continue to be shaded, although plain shapes are fairly steady.

Chicago — Scarcity of inquiries marks this week in structural shapes. Several old jobs are still pending, however, and await release.

Boston—While less than 1000 tons of structural shapes was awarded in round tonnages, small jobs bring the total much higher. A 373-ton garage was let for Boston Elevated Railway Co., Roxbury, Mass.

Worcester, Mass.—Three jobs aggregating 852 tons of structural shapes were placed last week, including 500 tons for a post office at Lowell, Mass.

Philadelphia—A buyers' market continues in structural shapes with prices at 1.60c to 1.65c, mill, and operations 50 to 60 per cent. While moderately good volume of work is on architects' boards, inquiries are developing slowly.

Pittsburgh—The steady demand for plain structural material as indicated by mill expectations is not matched by activity in awards and inquiry in this district. Some substantial bridge tonnage is in prospect for Allegheny county but bids are not expected to be asked for several weeks. Awards generally involve less than 100 tons at a time. The market on plain material usually is 1.65c, Pittsburgh, with 1.60c applied on large lots.

Cleveland — Structural steel awards are comparatively low after one or two lively weeks. Some work is due for closing during the current week; however, which may change the situation before the week is out. Specifications reaching the mills continue limited and while 1.65c, Pittsburg, continues the quoted market.

Birmingham, Ala. — Structural steel fabricating shops operate five and a half days a week or full time. New business is coming in steadily but in small tonnages. Few orders for 100 tons or more are reported.

Contracts Placed

6000 tons, nurses' home and power house, New York hospital—Cornell Medical unit, New York, to Harris Structural Steel Co., New York; Marc Eidlitz & Son, general contractor.

2500 tons, transmission towers, Louisville, Ky., to Bates Fabricator Steel Co., East Chicago, Ind.

2000 tons, telephone building, New Jersey Bell Telephone Co., Newark, N. J., to American Bridge Co.

2000 tons, plant, Consolidated Steel Corp., Maywood, Calif., to Consolidated Steel Corp., Los Angeles.

1500 tons, bridge across Missouri river, Niobraba, Nebr., to American Bridge Co.

1300 tons, office building, Thirtieth street, New York, to Dreier Iron Works, New York.

1245 tons, bridge, New York Central railroad at South Bend, Ind., to American Bridge Co.

1200 tons, warehouse, Brunswig Drug Co., Second street, Los Angeles, to McClintic-Marshall Co., Los Angeles.

1200 tons, addition and new building, Juilliard Graduate School of Music, 122 Broadway and Cleremont avenue, New York, to Hedden Iron Construction Co., New York.

1000 tons, structural work, Arundel Corp., Baltimore, to American Bridge Co.

800 tons, rebuilding blast furnace at Gary, Ind., for Illinois Steel Co., Chicago; understood awarded to American Bridge Co., boiler contract to John Mohr & Son.

750 tons, garage, Southern California Edison Co., South Hope street, to Consolidated Steel Corp., Los Angeles.

660 tons, Phillips Petroleum building, Bartlesville, Oklahoma., to Kansas City Structural Steel Co., Kansas City, Mo.

650 tons, buildings, Yale university, New Haven, Conn., to Palmer Steel Co., Springfield, Mass.; George A. Fuller Co., contractor.

600 tons, grade crossing, Chicago, for Chicago, Milwaukee, St. Paul & Pacific railroad, to McClintic-Marshall Co., Pittsburgh.

590 tons, Drexel institute dormitory, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, school 98, Douglasten, Queens, N. Y., to Harris Structural Steel Co., New York; Raymore Construction Co., general contractor. Listed in issue of Aug. 7 as going to unstated fabricator.

500 tons, post office, Lowell, Mass., to Eastern Bridge & Structural Co., Worcester, Mass.

500 tons, bridge, Lawson, Mo., for Chicago & Rock Island railroad, to American Bridge Co.

475 tons, bridge, Elmira, Mo., for Chicago, Rock Island & Pacific railroad, to American Bridge Co., Chicago.

400 tons, pier No. 1, San Francisco, to Moore Drydock Co., Oakland, Calif.

373 tons, garage, Boston Elevated Railway Co., Roxbury, Mass., to New England Structural Co., Boston.

350 tons, parochial school, Jefferson avenue, Brooklyn, N. Y., to George A. Just Co., Brooklyn.

335 tons, high school, Joliet township, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

300 tons, school 36, Jersey City, N. J., to F. G. Schaefer Iron Works, Edgewater, N. J.; D'Elia Construction, general contractor.

300 tons, Seventh avenue crossing for Southern Pacific Co., Tucson, Ariz., to Columbia Steel Co., San Francisco.

300 tons, building for Tennessee Copper Co., Copper Hill, Tenn., to Ingalls Iron Works Co., Birmingham, Ala.

300 tons, apartment, 891 Park avenue, New York, to unstated fabricator.

300 tons, apartment, Clarkson avenue, Brooklyn, N. Y., to Simon Holland & Son, Brooklyn.

300 tons, police station, sixteenth precinct, New York, to Grand Iron Works, Bronx, N. Y.

290 tons, five hangars and station buildings, Boeing Air Transport Inc., Seattle, to Joseph T. Ryerson & Son Inc., Chicago; Austin Co., Seattle, builder.

275 tons, jail, Eastview, Westchester, N. Y., to Just Structural Engineering Corp., White Plains, N. Y.; Charles Margotta, North Tarrytown, general contractor.

275 tons, freight house, Baltimore & Ohio railroad, Pittsburgh, to Pittsburgh Bridge & Iron Works, Pittsburgh.

250 tons, plant, Ohio Rubber Co., Willoughby, O., to Massillon Bridge & Structural Co., Massillon, O.; George A. Rutherford Co., general contractor.

250 tons assembly hall, 316-20 West Thirteen street, New York, to George A. Just Co., Brooklyn.

250 tons, junior and senior high school, Rye, N. Y., to Just Structural Engineering Corp., White Plains, N. Y.

250 tons, factory at Trona, Calif., to Consolidated Steel Corp., Los Angeles.

240 tons, Stuyvesant hall, Ohio Wesleyan university, Delaware, O., to Reliance Structural Co., Warren, O.

230 tons, sintering plant, Pittsburgh Steel Co., Monessen, Pa., to McClintic-Marshall Co., Pittsburgh.

225 tons, storage building, Westchester Light Co., Pleasantville, N. Y., to American Bridge Co.; Cuzzi Bros., Mt. Vernon, N. Y., general contractors.

225 tons, sales and service building, Connecticut Valley Realty Co., West Springfield, Mass., to Haarmann Steel Co., Holyoke, Mass; 36 tons reinforcing bars to A. D. Donald Co.; Fred T. Ley & Co. Inc., general contractor.

210 tons, Montgomery county courthouse and jail, Rockville, Md., to

Awards Compared

	Tons
Awards this week	**35,610**
Awards last week	**50,511**
Awards two weeks ago	**42,981**
Awards this week in 1929	**50,216**
Av. weekly awards, 1930	**35,723**
Av. weekly awards, 1929	**42,213**
Av. weekly awards, July	**37,137**
Tot. awards to date, 1929	**1,480,467**
Tot. awards to date, 1930	**1,250,308**

Dietrich Bros., Baltimore; J. J. McDevitt Co., Charlotte, N. C., general contractor.

210 tons, three bridges, Colleton county, S. C., to Roanoke Iron & Bridge Works Inc., Roanoke, Va.

200 tons, distributing station, Westmoreland avenue, White Plains, N. Y., Sheffield Farms Co., to North American Iron Works, Inc., Brooklyn; White Construction Co., general contractor.

200 tons, caissons for Boston, to Walsh-Holyoke Steam Boiler Works, Holyoke, Mass.

200 tons, telephone building, Torrington, Conn., to Levering & Garrigues Co., New York; R. W. Foote, New Haven, Conn., architect.

200 tons, highway bridges, New York state, to American Bridge Co.

200 tons, bridge in Dudley, Mass., to Eastern Bridge & Structural Co., Worcester, Mass.

190 tons, bank building, Brookline, Mass., to New England Structural Co., Boston.

175 tons, addition, Marquette Cement Mfg. Co., St. Louis, to McClintic-Marshall Co., Pittsburgh.

170 tons, theater, North Platte, Nebr., to McClintic-Marshall Co., Chicago.

152 tons, building, National Folding Box Co., New Haven, Conn., to Eastern Bridge & Structural Co., Worcester, Mass.

150 tons, training school for boys at Loch Raven, Md., to Morris Wheeler Co., Philadelphia; Davis Construction Co., Baltimore, general contractor.

150 tons, table frames, Schloemann Engineering Co., Pittsburgh, to Heyl-Patterson Co., Pittsburgh.

150 tons, substation, Dallas Tex., to Nashville Bridge Co., Nashville, Tenn.

150 tons, store and office building, Enid Building & Investment Co., Enid, Okla., to Hackney Iron & Steel Co., Enid.; D. C. Bass & Sons Construction Co., Enid, general contractor.

150 tons, control station, Dyckman street, New York Central railroad, to Hinkle Iron Co., New York; Aronberg-Fried Co., general contractor.

150 tons, Masonic Temple, Milton, Pa., to Shippers' Car Shops, Milton, Pa.

150 tons, hospital, Geneva, N. Y., to Hengbes Co., Rochester, N. Y.; 60 tons bars to same interest; Bentz Engineering Co., Salamanca, N. Y., general contractor.

125 tons, bridges, Wabash railroad, St. Louis, to McClintic-Marshall Co., Pittsburgh.

125 tons, building, Girard Model Works, Girard, Pa., to Erie Steel Construction Co., Erie, Pa.

115 tons, creamery plant, Boise Valley, Idaho, Dairymen's Co-operative, to the Bliss mill of the Austin Co., Cleveland; Austin Co., Seattle, builder.

100 tons, storage and office building, 869 Lexington avenue, New York, to Kues Bros. Iron Works, Bronx, N. Y.

100 tons or more, airport hangar, North Beach, Queens, N. Y., to McClintic-Marshall Co.

100 tons, warehouse and garage, Stamford Gas & Electric Co., Stamford, Conn., to Palmer Steel Co., Springfield, Mass.; Turner Construction Co., general contractor.

100 tons, garage and offices, State and Farrington streets, Flushing, N. Y., to L. Klein Iron Works, Astoria, N. Y.

100 tons or more, bridge, Bathurst street, Toronto, Ont., Canadian National railways, to Canadian Bridge Co., Walkerville, Ont.; Richardson Construction Co., general contractor.

100 tons or more, bridge, Pacific Great Eastern railway, Lillooet, B. C., to Dominion Bridge Co., Vancouver, B. C.

Contracts Pending

9500 tons, subway, route 108, section 6, Queens, N. Y., readvertised for bids early in September, bids taken April 29 rejected.

5100 tons, subway, route 107, section 8, Lafayette street, Brooklyn, N. Y.; bids early in September.

3200 tons, Burrard street bridge, Vancouver, B. C.; William McQueen, city clerk, closes bids Oct. 31.

3600 tons, office building, state of Ohio, Columbus, O.; bids closed Aug. 25.

2000 tons, bridge, Bucksport, Me.

1800 tons, railroad bridge, Indiana Belt railroad, Bellwood, Ind.

1700 tons, Lincoln Park viaduct, Chicago; Price & Bros., general contractors; bids opened Aug. 25.

1500 tons, assay office building, United States treasury, Old Slip, N. Y.; bids Sept. 11.

1250 tons, Senn high school, Chicago.

1000 tons, office building, Wall street, New York.

1000 tons, nurses' home, Brooklyn hospital, Brooklyn, N. Y.

1000 tons, highway bridges, New York; bids in and being taken.

900 tons, Chicago, extensions to elevated platform lines; previously reported as 1200 tons.

600 tons, plant, Brunswick Radio Corp., Muskegon, Mich.

560 tons, Atlantic avenue bridge, Los Angeles; bids Sept. 15.

500 to 600 tons, hospital building, Cleveland Clinic, Cleveland; bids closed Aug. 28.

500 tons or more, various units, John Carroll university buildings, Cleveland; bids to be asked about Sept. 15; Philip L. Small Inc., Terminal Tower building, Cleveland, architect.

500 tons, high school Mamaroneck, N. Y.

400 tons, highway bridge, North Carolina; bids in.

370 tons, bridge between Mexico and Peru, Me.

350 tons, addition school No. 123, Queens, N. Y.

Concrete Bars

Individual Jobs Larger—2000-ton Dam Let in Pennsylvania, 1000-ton Wharf in Seattle—Vancouver Bridge to Take 2000 Tons—New York Subways Revived

REINFORCING BAR PRICES, PAGE 69

New York — Concrete reinforcing bar prices are weak. Attractive tonnages bring out low bids. One recent 1000-ton job is said to have gone close to 1.60c, Pittsburgh. Shading is noted even on smaller lots. New work coming out for figures has slumped, although two subway sections on which bids will be taken in September will take more than 1200 tons.

Boston—Little change has developed in concrete bars this past week. Practically the only tonnage placed was for a plant at Cambridge, Mass., 250 tons. Odd jobs totaled about 200 tons. Prices are weak, although small lots continue to bring fair returns.

Awards Compared

	Tons
Awards this week	**11,055**
Awards last week	**7,312**
Awards two weeks ago	**1,280**
Awards this week in 1929	**4,275**
Av. weekly awards, 1929	**5,849**
Av. weekly awards, 1930	**6,893**
Average weekly awards, July	**6,145**
Total awards to date, 1929	**220,537**
Total awards to date, 1930	**241248**

Cleveland—Concrete bars are slightly more active. The 750 tons for Station road bridge, Brecksville, O., went to Truscon Steel Co. It is understood Republic Steel Corp. will do the rolling. Bids close on Thursday of this week on the general contract for Higbee Co.'s building. Billet bars are 1.65c, Cleveland or Pittsburgh, although some claim to be adhering to 1.70c on cut lengths. Rail steel bars are quoted 1.70c, mill.

Pittsburgh—Reinforcing bar tonnage is showing no more than its usual seasonal decrease with the outlook regarded fair for the remainder of the quarter. An additional 2000 tons has been placed for a power dam at Safe Harbor, Pa. Both awards and inquiry in this district are light. Mill prices are fairly steady and unchanged.

Birmingham, Ala.—Numerous 50-ton contracts for reinforcing concrete bars are being received. Connors Steel Co. reports 100 tons for a quarantine station at New Orleans, and a reservation building at Fort Benning, Ga. Dealers are stocking and the aggregate business is fairly good with mills active on this class of steel. Road building is pro-

(*Continued on Page 77*)

Strip

Larger Automotive Buying Is Aid, Though Total Is Not Large —Stamping Plants Busier

STRIP PRICES, PAGE 69

Worcester, Mass.—Production of cold-rolled steel which started briskly the first of the month is slowing down, bringing the month's total to a par with July. Both months, however, show a large increase over June, which was the year's low. While scattered instances are reported of 2.50c being quoted, 2.60c is still standard. Inquiries are strong, demand being mostly for small prompt lots.

New York—Strip buying is profoundly dull with prices unchanged at 1.65c to 1.70c, Pittsburgh, on wide hot strip and 1.75c to 1.80c, Pittsburgh, on narrow. Cold-rolled strip is 2.35c to 2.40c, Pittsburgh.

Pittsburgh—The strip market continues slow despite a slight increase in requirements of several automobile companies. Incoming tonnage has failed to improve operations materially, which hold around 35 to 40 per cent for hot mills and 25 to 30 per cent for cold-rolled strip. Interest in future requirements usually is based on long contracts at present prices, in which arrangements producers are not interested. The market currently is 1.65c and 1.75c for the two sizes of hot strip and 2.35c to 2.45c for cold-rolled strip.

Cleveland—While some job stamping plants are busier and taking more material, the strip market still is slow. Prospects are increasingly bright since some automotive tonnage is due for release during the current week. Cold strip is 2.35c, Cleveland, in large quantities. Small amounts still command 2.45c. Hot strip in the wider sizes is quoted 1.65c, Pittsburgh, and narrow at 1.75c, though occasionally shoppers are able to develop slightly lower.

Youngstown, O.—Accumulated backlogs in hot-rolled strip steel are now being worked off and as mills find it more difficult to keep busy, some units are being put upon short time. This is a reflection of the disappointing lack of demand from automotive interests.

Chicago—Hot strip, tying in with the automobile situation, shows little change. The cold-rolled strip market is quiet. The presence of more inquiries is noted, though little more than the average of the past month has been placed. Prices are unchanged on hot strip at 1.90c, Chicago, for narrow, and 1.80c on wide. The cold-rolled price continues 2.45c, Pittsburgh or Cleveland base, or 2.55c to 2.65c, Chicago.

Warehouse Trade Shows No Falling Off

Warehouse Prices, Page 91

New York—Jobbers report current business about 25 per cent under the average rate for last year. Others describe the situation as less active. Prices are easy at unchanged levels.

Boston—Many small lots keep warehouse sales volume steady. Prices have been held firmly.

Philadelphia—Warehouse buying is steady at the restricted rate of the past several weeks. Prices are unchanged.

Pittsburgh—Sales lack briskness. Improvement is absent compared with a month ago but a pickup is looked for during September. Prices are unchanged.

Cincinnati—Warehouses report volume so far this month has failed o expand, with individual orders in fair number but of light tonnage. Prices are unchanged.

Detroit—Warehouses ordinarily find August better than July and this year's curve is repeated with this month showing a 10 per cent gain. The increase, however, was made in the first ten days of the month.

Chicago—Heavy lines are moving in only fair volume. Galvanized American ingot iron from Chicago warehouse has been cut to 5.85c on less than 100 bundle lots and 5.50c on 100 bundles or more.

St. Louis—Warehouse business is showing distinct improvement compared with July and the first week of August. More favorable weather and exhausted consumer stocks are the chief stimulating features.

Operations Show Little Change in Most Cases

Youngstown, O.—Indications of improvement in operation are seen in this week's schedules. Independent steel ingot output has been augmented by the output of three additional furnaces, making 28 of 51 active. Steel Corporation steel production is at 55 per cent.

Strip mill operations show the greatest gain with all of the eight independent units active, although some are scheduled for only partial operations. Sheet mill operations show 52 of the 120 independent units engaged, with the Falcon plant of Empire Steel again resuming. Tin plate mills average about 70 per cent.

Pipe mill output is about 70 per cent of full capacity. Lap weld, seamless and electric mills are fully engaged and the idle capacity is in butt-weld departments. Independent bar mill operations are at 55, those of the Corporation at 60 per cent.

Pittsburgh—Operating rates are unchanged. Ingot production holds at 55 per cent. Sheets are unchanged at 45 to 50, with tin plate 65 to 70. Strip continues 35 to 40, with pipe 65 to 70.

Buffalo—Operations of the Lackawanna plant of the Bethlehem Steel Co. are the same as last week, 15 open hearths out of 24. Donner plant of the Republic Steel Corp. is operating four out of nine open hearths; Wickwire-Spencer Corp. is operating three out of four open hearths and Seneca Iron & Steel Co. is at 50 to 60 per cent.

Cleveland—Lack of need for steel has caused four open-hearth furnaces to be put out this week, reducing the active percentage to 27 from 40 per cent the preceding week. A blast furnace stack has been blown out this week.

Chicago—Steelworks furnace rate is unchanged this week at about 55 per cent of capacity. Sheet mills are at 70 to 75 per cent capacity.

Birmingham, Ala.—While many shops fabricating steel are operating five and a half days the week, there is less activity in open-hearth furnace output and finishing mills operation. Estimate is that operations are between 57 and 60 per cent capacity.

Cold-Finished Tonnage Shows an Increase

Pittsburgh—Specification for cold-finished steel bars improved moderately last week, largely as the result of better demand from several automotive companies. Aggregate tonnage from this industry still is seasonally light but represents an improvement over early August and indicates that heavier shipments are in store for September. The market continues 2.10c on current business.

Cleveland—Specifications for cold-finished bars for August are about 15 per cent ahead of July to the same date.

Concrete Bars

(*Continued from Page* 73)

posed by the state which promises a large demand for bars.

Contracts Placed

2000 tons, power dam, Safe Harbor, Pa., Arundel Corp., to Kalman Steel Co., Chicago, in addition to 2000 tons awarded same interest as noted in STEEL of June 26, 1930.

1200 tons, piers, Central-Lorain bridge, Cleveland, to Bourne-Fuller Co. division, Cleveland, Republic Steel Corp., Youngstown, O.

1000 tons, wharf substructure, American Can Co., Seattle, to Pacific Coast Steel Co., Seattle; Henry & McFee, Seattle, subcontractors.

1000 tons, additional tonnage, A. E. Staley Mfg. Co., Decatur, Ill., to unstated Chicago fabricator.

750 tons, Station road bridge, Brecksville, O., to Truscon Steel Co., Youngstown, O.; Highway Construction Co., Cleveland, general contractor. Bars to be rolled by Bourne-Fuller division, Republic Steel Corp.

630 tons, Elk street market, Buffalo, to Kalman Steel Co., Chicago; John Johnson Construction Co., Buffalo, general contractor.

500 tons, Monroe street sewer, Chicago, to Concrete Steel Co., New York.

400 tons, elevator, Chesapeake & Ohio railroad, South Chicago, Ill., to Olney J. Dean Co., Chicago.

350 tons, 12-story Larson office building, Yakima, Wash., to Northwest Steel Rolling Mills, Seattle.

350 tons, sewage treatment works, Rockford, Ill., to Inland Steel Co., Chicago.

300 tons, warehouse, Brunswig Drug Co., Second street, Los Angeles, to unstated interest.

300 tons, addition to hotel, Pasadena, Calif., to Soule Steel Co., Los Angeles.

250 tons, plant, F. W. Webster & Co., Cambridge, Mass., to Concrete Steel Co., Chicago.

200 tons, Towers building, Battle Creek, Mich., to American System of Reinforcing, Chicago.

200 tons, garage for Southern California Edison Co., South Hope street, Los Angeles, to unstated interest.

180 tons, station, Public Service Electric Distributing Co., Passaic, N. J., to Igoe Bros., Newark, N. J.

175 tons, two district schools near Akron, O., to Concrete Steel Co., Chicago.

160 tons, distributing station, Sheffield Farms, White Plains, N. Y., to Truscon Steel Co., Youngstown, O.; White Construction Co., general contractor.

150 tons, lion house, Chicago zoo, Chicago, to Concrete Engineering Co., Chicago.

135 tons, postoffice, Flint, Mich., to Olney J. Dean Co., Chicago.

125 tons, reservoir, Wilkes-Barre, Pa., to Concrete Steel Co., Chicago.

100 tons or more, Wesley hospital, Oklahoma City, Okla., to Capital Steel & Iron Co., Oklahoma City; Bellows Construction Co., general contractor.

100 tons, quarantine station, New Orleans, La., and a reservation building, Fort Benning, Ga., to Conners Steel Co.

100 tons, plant for Consolidated Steel Corp., Maywood, Calif., to unstated interest.

100 tons, alterations, Palace Hip building, Seattle, to Northwest Steel Rolling Mills, Seattle.

100 tons, training school for boys, Loch Raven, Md., to Concrete Steel Co., New York.

100 tons, governmental building, Woods Hole, Mass., to George B. H. Macomber Co.

100 tons, high school, Rye, N. Y., to Truscon Steel Co., Youngstown, O.

Contracts Pending

2000 tons, Burrard street bridge, Vancouver, B. C.; William McQueen, city clerk, closes bids Oct. 31.

800 tons, Riverside drive connections, Hudson river bridge approach, New York; bids Sept. 15.

790 tons, subway, route 108, section 6, Queens, N. Y., readvertised early in September; bids taken April 29 rejected.

700 tons, six bridges, Cook county, Illinois; bids opened Aug. 25.

500 tons or more, various units, John Carroll university buildings, Cleveland; bids to be asked about Sept. 15; Philip L. Small Inc., Terminal Tower building, Cleveland, architect.

500 tons, 8-story office building, Acme Realty Co., East Ninth street and Chester avenue, Cleveland; general contract to Aronberg-Fried Co., Cleveland.

500 tons, Higbee Co. department store, Cleveland terminal group, Cleveland; general contractors' bids close Aug. 28.

500 tons, addition to coliseum, Exposi-

(*Concluded on Page* 88)

Pipe

35,000-ton Steel Pipeline Let—Cast Interest Wanes—Toledo Awards 900 Tons to Clow

PIPE PRICES, PAGE 91

New York—Cast pipe buying and inquiry are light. Foundry backlogs are being rapidly reduced. In some instances operation rates have been lowered. Several New York city departments opened bids this week on small pipe, pipe fittings, valves, engineers' and steamfitters' supplies. A large tonnage of specialties is included.

Steel pipe sales include approximately 900 tons of 10¾-inch pipe for a midwestern oil company, the order going to a Pittsburgh mill.

Boston—No municipal lettings of cast pipe took place last week. Several carload orders for filling-in purposes were let, together with a fair amount of private tonnage.

Pittsburgh—Pittsburgh mills lost the 35,000-ton order of 18-inch electric welded pipe for the Central Public Service Corp. It was awarded Youngstown Sheet & Tube Co. A few other line pipe projects remain pending, while new inquiry is limited to one from the Moody-Seagraves Co. for a 100-mile 6-inch line in Texas. Standard pipe demand still is restricted and quietness marks activity in mechanical tubing and locomotive and boiler tubes. Mill operations are unchanged at 60 to 75 per cent, with production on larger sizes of lapweld and seamless pipe at capacity.

Cleveland—Youngstown Sheet & Tube Co., which within two or three weeks will start its new electric weld pipe mill, has booked an order for 260 miles of 18-inch natural gas pipe from the Central Public Service Corp., for a line from Kentucky to central Indiana. The order involves 35,000 tons and is valued at over $2,500,000.

Chicago—Quiet continues and awards locally to contractors continue small in size, and slow. Fond du Lac, Wis., awarded 600 tons to American Cast Iron Pipe Co.

Birmingham, Ala.—Cast pipe lettings are less numerous and most are for msall lots.

Contracts Placed

100 tons, 6-inch Monocast centrifgual pipe for Indian school, Tacoma, Wash., to American Cast Iron Pipe Co., Birmingham, Ala.

600 tons, 4, 6 and 16-inch cast pipe for Fond du Lac, Wis., to American Cast Iron Pipe Co., Birmingham, Ala.; previously reported as 135 tons pending. A tonnage of 20-inch went to Universal Pipe Co.

900 tons, 30-inch cast pipe for Toledo, O., to James B. Clow & Sons, Chicago; remainder of 600 tons still pending.

Steel Pipe Orders

35,000 tons, 260 miles of 18-inch electric welded steel pipe, Central Public Service Corp. for natural gas line from Kentucky to central Indiana.

900 tons of 10¾-inch steel pipe for a midwestern oil company, to a Pittsburgh mill.

Contracts Pending

500 tons, 4 to 8-inch class 150, Fresno, Calif; bids received.

350 tons, 6-inch case pipe, for Colonie, N. Y.; bids Sept. 5.

125 tons, 4 and 6-inch cast pipe for Saxonburg, Pa.; bids in.

Steel Pipe Pending

5000 tons, 100 miles 6-inch pipe, Moody-Seagraves Co., for line in Texas.

Bendix Reports Earnings

Bendix Aviation Corp. reports net earnings after all charges, including federal taxes, for the quarter ended June 30 of $779,255 or 37 cents a share on the 2,097,454 shares of

WHERE THERE'S EVIDENCE OF HIGHER QUALITY

Surfaces so remarkably smooth and clean tell you—"this is modern pipe . . . prepared to last longer and give better service because it's made Scale Free and Spellerized!"

There is no mill-scale to set up galvanic action and cause "pitting"; nor to hinder effective galvanizing or other protectve coatings; nor to obstruct full flow; nor to come loose and clog or damage anything. A special rolling or breakdown process—applied to butt-weld sizes ½ to 3-inch—removes the troublesome scale and leaves a clean, smooth surface that means all around better quality in the pipe.

This special rolling is known as the Scale Free Process and is an exclusive feature, invented and developed by National Tube Company—be sure to specify NATIONAL Scale Free Pipe. The Scale Free Process, plus Spellerizing, are two of many reasons why NATIONAL is—

America's Standard Wrought Pipe

NATIONAL TUBE COMPANY • Pittsburgh, Pa.
Subsidiary of United States Steel Corporation

SCALE FREE PIPE
SPELLERIZED

stock outstanding. For the first six months, net after all charges was $1,530,937 or 73 cents a share on the stock. No comparison with a year ago is available because of the change in the corporate structure incident to many acquisitions and consolidations in which the corporation has participated.

August Bolt and Nut Buying Poorest of Year

Bolt, Nut, Rivet Prices, Page 69

Pittsburgh—Bolt, nut and rivet sales are dragging, with August business for some companies the poorest of the year. Jobbers and most consumers are buying in small lots and there is no tendency to anticipate needs. Prices remain steady at 73 off for bolts and nuts and 2.75c for large rivets.

Chicago—Jobbers' orders are fair, but all represent hand-to-mouth purchasing. Producers await signing of fourth quarter contracts to sense takers' commitments, and the extent of low inventories. Prices are unchanged.

Cleveland—Nut and bolt tonnage shows a slight increase but rivet orders still are few. Plant operations vary between 40 and 50 per cent of capacity for nuts and bolts. Rivet making is on a lower scale. The rivet price reduction has not caused increase of buying.

Worthington Improves Financial Position

Worthington Pump & Machinery Corp., Harrison, N. J., further improved its financial status during the first half of the year. As of June 30, current assets were $17,525,690 against current liabilities of $1,225,722. Cash call loans and government security holdings alone aggregated $6,920,560 and were 465 per cent in excess of total liabilities. As of the same date, inventories totaled $5,662,733; reserves, $1,674,920; and surplus, $5,701,103.

Net income of $1,052,732 for the first half of 1930, after deducting all charges including taxes and depreciation, was substantially larger than the total net reported for each of the full years 1922 to 1928, inclusive. It was only $46,696 less than that reported for the corresponding period of 1929. The first half net of this year was equal to $4.31 a share on the 126,921 shares of $100 par common stock outstanding, compared with $4.75 a share on 129,921 shares of common issued in the first half of 1929.

Wire

Quiet Situation Continues—Effects of Drought Causes Delay in Farmer Buying

WIRE PRICES, PAGE 69

Pittsburgh—Sales of wire products continue to reflect the quiet in industrial operations while the general agricultural situation partially is reflected in demand for fencing and other farm materials. Business in the latter ordinarily begins its seasonal upturn at this time but because of the almost complete loss of crops in some sections it is believed that some purchases of wire products will be restricted if not entirely deferred at this time. Prices remain fairly steady, with wire nails $2.05 to jobbers and plain wire 2.30c to the manufacturing trade. Wire rods continue $36.

Worcester, Mass.—With most of its strength in miscellaneous lines the wire market has little fluctuation. Production remains at about 50 per cent. Plain bright wire to dealers is still at 2.40c, base, Worcester.

Cleveland—Wire mills report a few mixed carloads of wire, wire nails and fence from jobbers. Manufacturers' wire orders, however, have been scarce for two weeks. The latter is quoted 2.30c, Cleveland. On nails, however, to jobbers $2.05, Cleveland is the selling price.

Chicago—Wire producers are marking time on a rather low volume of sales. Jobbers are slow. There is no change in orders or specifications from the average of the past three or four weeks. Texas and some of the southwestern states are specifying in fairly good quantity.

Tin Plate Specifications Are Heavier

Tin Plate Prices, Page 69

Pittsburgh—Tin plate shipments are heavier, reflecting receipt of some rush orders from can companies who had failed to anticipate their requirements for this period. Mills had produced some tin plate in anticipation of current demand, however, and the improvement in shipments has not affected operations, which continue around 70 per cent. The heavy requirements of the leading canmakers are taken as definite indication that effects of the recent drought on tin plate demand will not be serious. Tin plate continues $5.25 per 100-pound base box.

New York—Tin plate specifications are coming out freely in important instances. In fact, some sellers report that certain tonnage is being specified ahead of contract requirements. Prices, meanwhile, are unchanged at $5.25 per 100-pound box, Pittsburgh.

Aircraft Output Valued at $61,973,079 Census Shows

Aircraft and parts manufactured in the United States in 1929 were valued at $61,973,079, an increase of 192.9 per cent over 1927, according to the bureau of the census. In the 1929 output were 5130 airplanes, valued at $38,724,987; 176 seaplanes and amphibians, valued at $5,949,671; 6188 parachutes, valued at $1,734,602; 14,184 propellers, valued at $2,040,299; other complete aircraft, $639,990; airplane parts and engines made for sale as such, $8,187,285; repair and experimental work, $3,387,269; other products, $1,605,976.

The 1929 census of manufactures revealed 117 establishments, compared with 70 in 1927. Employes in 1929 averaged 9856, against 4422 in 1927. Wages in 1929 amounted to $18,804,527, an increase of 174.2 per cent over 1927.

Decline in Crane Business Was Marked in July

New York—Shipments, new orders and unfilled volume declined in July as compared with June, according to the Electric Overhead Crane institute. The decline in tonnage capacity and dollar value in new orders was sharp. Shipments included 90 units with a tonnage capacity of 1781½, valued at $1,005,446.35. This compares with 92 units, tonnage capacity 1434½, valued at $956,366.85, in June. New orders totaled 70 units with a tonnage capacity of 992 valued at $601,333 compared with 71 units, tonnage capacity 1239, valued at $740,866.70, in June. Unfilled orders on Aug. 1 included 202 units, compared with 237 on July 1. Such unfilled business called for a tonnage capacity of 4776, valued at $2,706,101.68, compared with tonnage capacity of 5729 valued at $3,249,264.03 on July 1. In July, 1929, shipments included 145 units, new orders 126 and unfilled 494.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$17.50
Pittsburgh, district fur.	18.50
Pittsburgh, delivered	19.13 to 19.63
Valley, furnace	18.00
Cleveland fur., local del.	18.00
Philadelphia, delivered	19.26 to 19.76
Virginia, furnace	17.75
Granite City, Ill., fur.	18.00 to 18.50
Buffalo, fur., local del.	18.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail Brooklyn	20.91
Buff., all-rail, Newark	19.28
Ala., Bir. fur., local del.	14.00
Alabama, del. Chicago	18.01
Alabama, del. St. Louis	17.42
Alabama, del. Cincinnati	16.19 to 17.19
Alabama, del. Cleveland	18.51 to 19.01
Ala., Phila., dock del.	17.25 to 18.25
Ala., Balt., dock del.	17.00 to 18.00
Alabama, New York dock	17.00 to 17.50
Ala., Boston dock del.	20.21
Tenn., Bir. base, local del.	14.00
Tennessee, del. Cin.	16.19 to 17.19
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo. fur., local del.	19.00
Buff., all-rail, Brooklyn	21.41
Buffalo, all-rail Newark	19.78
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del., Phila.	19.76 to 20.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	20.00
Eastern, del., Phila.	20.26 to 20.76

MALLEABLE

Chicago, furnace	17.50
Cleveland fur., local del.	18.00
Pittsburgh district fur.	19.00
Pittsburgh, delivered	19.63 to 20.13
Valley furnace	18.50
Buffalo fur., local del.	19.00
Eastern Penna., delivered	19.26 to 20.91
Granite City, Ill., fur.	18.00 to 18.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh dist. fur.	18.50
Pittsburgh, delivered	19.13 to 19.63
Eastern Penn., del.	18.00 to 18.50
Buffalo fur., local del.	18.00
Montreal, delivered	22.50
Valley furnace	18.00

BESSEMBER

Valley furnace	18.50
Pi'tsburgh, delivered	20.26

LOW PHOS

Valley fur., standard	27.00
Philadelphia, standard	24.26 to 24.76
Furnace, copper-bearing	23.00 to 23.50

GRAY FORGE

Pittsburgh district fur.	18.00
Pittsburgh, delivered	18.63 to 19.13

CHARCOAL

Lake Superior, del. Chicago	27.04

SILVERY

Jackson County, O., fur., in per cents

5—$21.50; 6—$21.50; 7—$22.00; 8—$22.50 to $23.00; 9—$23.00 to $24.00; 10—$23.50 to $27.00; 11—$24.50 to $28.00; 12—$25.50 to $30.00; 13—$26.50 to $32.00.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents

10—$29; 11—$31; 12—$33; 13—$35; 14—$37; 15—$39; 16—$42; 17—$45.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.50 to 2.60
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ov., Connell. basis	5.50
Portsmouth, O. ov., Connell. basis	5.50
Buffalo ovens	8.00 to 8.50
Detroit ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross Ton, 51½%, Lower Lake Ports	
Old range	$4.80
Mesabi	4.65
Old range	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58.65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.50 to 11.00
North African low phosphorus	10.50
Swedish basic, 65%	9.50 to 10.50
Swedish low phos.	11.00
Spanish, North African basic, 50 to 60%	9.50 to 10.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$11.75 to 12.00
Chrome ore, 48%, net ton c.i.f.	$21.50 to 22.50

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	27 to 28 cents
Indian, 48-50%	27 to 28 cents
Brazilian, 46-48%	25 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Per net ton

9 x 4½ x 2½	65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore base	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$31.00
Pittsburgh, bessemer	31.00
Youngstown	31.00
Cleveland	31.00
Philadelphia	36.30
Chicago	32.00
Forging, Chicago	37.00
Forging, Pittsburgh	36.00
Forgings, Philadelphia	41.30

SHEET BARS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00
Chicago	32.00

SLABS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

WIRE RODS

Pittsburgh, Cleveland	$36.00
Chicago	37.00

SKELP

All grades, Pittsburgh	1.70c to 1.75c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$99.00
*Ferromanganese, del. Pittsburgh	103.79
Spiegeleisen, 19-21%, domestic fur. spot†	33.00
*Ferrosilicon, 50 per cent, freight all., c. l.	83.50
*Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon. cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do., one ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton, carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Fluorspar

85 and 5 per cent grade

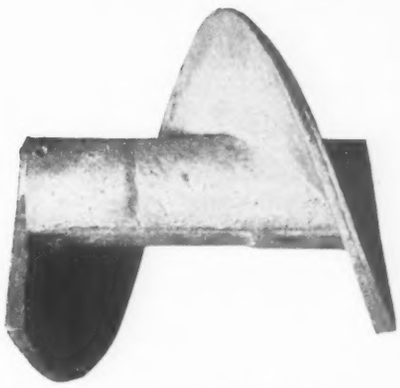
Washed gravel Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide, gross ton	19.50

FARRELL'S EIGHTY FIVE -85

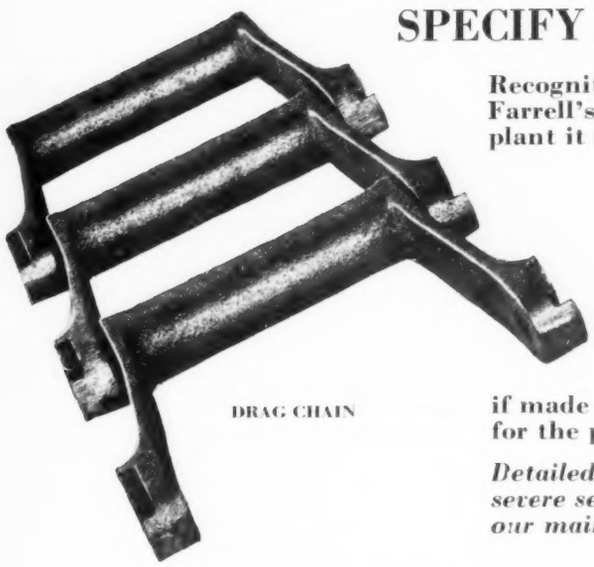
TOUGH-RIGID-STRONG-WEAR RESISTING CAST STEEL

TRADE MARK

ELEVATOR BUCKETS



SCREW CONVEYOR FLIGHTS



DRAG CHAIN

SPECIFY IT! DEMAND IT! USE IT!

Recognition of the meritable performance of vital parts cast of Farrell's 85 has resulted in a country-wide movement to supplant it in place of inferior metals where the wear takes place and shock and impact are to be contended with.

Innumerable instances of practical savings being effected could be cited—in building construction, road building, cement mills, quarries, brick plants, iron, steel and other metal fabricating mills, mines, and, recently in that field of most exacting requirements —aircraft manufacture.

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Phone: Rittenhouse 9840

BIRMINGHAM OFFICE—2124 Highland Avenue
Phone: 4-2393

CHICAGO OFFICE — 5 So. Wabash Avenue
Phone: Franklin 1805

DULUTH OFFICE—611 Providence Bldg.
Phone: Melrose 1095-J

DENVER OFFICE — 3417 E. 14th Avenue

FARRELL-CHEEK

Pig Iron

Market Continues Quiet, with Small, Prompt Sales the Rule—Shipments Fair—Prices Steady

PIG IRON PRICES, PAGE 80

Pittsburgh—Improvement is lacking in the pig iron market, demand continuing at a low ebb, with August sales and shipments probably the smallest for the year to date. Foundry and steelworks operations still are light. Some radiator manufacturers are operating at higher rates, but this improvement is offset by continued quietness in other directions. Prices are nominal and unchanged.

Boston—Sales of pig iron increased to 3500 tons in the past week, Mystic Iron Works, Everett, Mass., booking 2000 tons, and the remainder going to Buffalo furnaces. Buffalo No. 2 plain and No. 2X still are offered at $16, furnace, with some sales of No. 1X also going at $16, although $16.50 has applied occasionally. A small tonnage of Indiana iron corresponding to No. 2X was sold at $19.75 to $20.25, on dock, duty paid.

New York—Improved buying brings sales of pig iron to more than 8000 tons. One seller reports sales of 3250 tons. Pending inquiry totals 3000 tons including at least three lots of 500 tons each. Buffalo foundry iron is holding at $16, base, with continued waiving of differentials. Southern foundry iron is easy at $17 to $17.50, delivered, New York docks.

Philadelphia—Pig iron buying continues of a hand-to-mouth character, though two or three fair size tonnages are pending. Two large mills are expected to place tonnages of basic. Prices are unchanged, No. 2 foundry holding at $18.50 to $19, furnace.

Youngstown, O.—Small sales of various grades of pig iron continue to be made from local furnaces, and shipments are fairly steady. Prices are unchanged.

Cleveland—The market is quieter, though the rate of shipments continues slightly ahead of that in July. Furnace interests with headquarters in Cleveland booked approximately 8500 tons in the past week, compared with 13,000 tons in the week preceding. A Toledo, O., melter is in the market for 1500 tons ,and another western Ohio consumer wants 1000 tons; other inquiries are considerably smaller. Foundry iron continues $18, base, Cleveland, for local delivery. Lake furnaces quote $17, base, in competitive territory, occasionally waiving silicon differentials and absorbing portions of freight rates.

Otis Steel Co. has blown out the second of its two stacks, its blast furnace department now being idle.

Buffalo—Sales of pig iron are confined to small lots. Producers booked an aggregate of about 5000 tons during the past week. Foundry operation shows no signs of an immediate increase. Prices are unchanged.

Cincinnati—With two exceptions spot shipments made up the pig iron business during the past week. A southern Ohio melter ordered 2000 tons of northern foundry iron, and an eastern Ohio user took 500 tons. Quotations on southern iron remain unchanged with inquiries so small and few no test is available. A southern Indiana buyer is inquiring for 300 tons of southern iron.

Chicago—Furnaces in blast are operating at about 75 per cent of capacity, while foundries are operating at 30 to 40 per cent. Stocks on furnace yards are large. More activity is noted in the market for charcoal iron. August shipments generally are about 15 per cent higher than those of July. The Chicago furnace price now is $17.50, base, for local delivery, $18 being out of the picture. Some sales are reported as low as $17.

Birmingham, Ala.—Sentiment has improved but tonnage is no larger than in recent weeks, with shipments a little under production. Low freight rates by rail and water to Atlantic coast points will continue after Sept. 1, but few orders have been booked recently from that territory. Prices are unchanged.

St. Louis—Melters are showing interest, and larger purchasing is expected in the next few weeks. Shipments are picking up steadily, and so far exceed the July rate. Recent sales total 2400 tons, evenly divided between northern and southern sellers. The lowest prices heard of are $12, base, Birmingham, or $16.42, delivered, St. Louis; $17.50, base, Chicago furnace, and $18 to $18.50, Granite City.

Toronto, Ont.—Merchant pig iron sales developed more volume in the past week, due to an increasing number of melters in the market. Sales generally are in small lots. Prices are steady. Production is down, with five stacks operating.

Ferroalloys Moving to Mills at Slow Rate

Ferroalloy Prices, Page 80

Pittsburgh—Shipments of ferroalloys remain slow. The failure of steelmaking operations to show their anticipated upturn this month is reflected in quietness in the movement of ferromanganese and spiegeleisen. Prices on these two grades continue $103.79, delivered, and $33, furnace, respectively, for small lots. Prices on other alloys are unchanged, with demand continuing quiet.

New York—Ferromanganese is moving at a rate comparable to the continued reduced operations at steel mills. Prices are $99, duty paid, tidewater, on lots of carloads to 500 tons annually. Domestic spiegeleisen, 19 to 21 per cent, continues $33, furnace, subject to differentials on quantities larger than carloads.

Semi-finished Steel in Quiet Market

Semifinished Prices, Page 80

Pittsburgh—Occasional small and medium orders for semifinished steel constitute most of the activity in this market. There is no forward buying of large lots and in view of continued quietness in finishing mill operations consumers are making few inquiries. Prices remain steady, rerolling billets, slabs and sheet bars continuing $31, with forging bilets steady on recent business at $36. Wire rods continue quiet at $36.

Philadelphia—Rerolling billets are steady at $31, base, Pittsburgh, and forging quality $36. The market is quiet.

Youngstown, O.—With a slight expansion in the operating rates of independent sheet mills has come a small gain in demand for sheet bars. Strip mill activities have been maintaining billet requirements. Wire rods are in fairly good demand. Three additional independent open hearths have been put on the active list, making the total 28 out of 51 units.

Cleveland—The market for sheet bars, billets and slabs remains quiet, with the price steady at $31, base, Cleveland and Youngstown. The leading merchant producer continues to operate four of its 14 open hearths.

Scrap

Prices Advance Slightly on Buying—Scarcity Continues in Best Grades—Movement Is Small

Chicago—Sales of iron and steel scrap are spotty. Consumers will not buy freely. Railroad offerings are small, indicating actual lessening of supplies. By this token prices should rise but the low volume of sales keeps prices, while unchanged, yet untested. Heavy melting steel at $12 to $12.25 has been a long time without large sales testing this price. Activities of district steelworks add nothing encouraging to the scrap situation.

New York—A stronger tone prevails in scrap and heavy breakable cast has been advanced 50 cents. This is based on a purchase of several hundred tons for Florence, N. J., with further tonnage under negotiation. Strength at Pittsburgh is reflected in higher offerings here for

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	**10.50 to 12.00**
Boston dealers	9.05 to 9.55
Buffalo, No. 1	**13.00 to 13.50**
Buffalo, No. 2	**11.00 to 11.50**
Chicago	12.00 to 12.25
Cinci., deal.	**11.25 to 11.75**
Cleve., No. 1	**12.00 to 12.25**
Cleve., No. 2	**11.25 to 11.50**
Det., No. 1 deal	**1100 to 11.50**
Det., No. 2 deal	**9.50 to 10.00**
E. Pa. del. mill	**12.50**
N. Y. del. R. R.	**9.00 to 10.00**
N. Y. deal No. 2	**6.25 to 6.75**
N. Y., deal yd.	**6.00 to 6.50**
Pitts. No. 1	15.25 to 15.75
St. L. No. 1 sel.	**11.50 to 12.00**
Federal, Ill.	11.00 to 11.50
Granite C., Ill.	**10.00 to 10.25**
Valleys, No. 1	15.25 to 15.50

COMPRESSED SHEETS

Buffalo, dealers	**11.25 to 11.50**
Chicago	**10.25 to 10.75**
Cleveland	**11.50**
Detroit, dealers	**11.00 to 11.50**
E. Pa. new mat.	**11.50**
Pittsburgh	15.00 to 15.50
Valleys	14.75 to 15.00

BUNDLED SHEETS

Buffalo	**9.00 to 9.50**
Cinti., deal.	**9.75 to 10.25**
Cleveland	**9.00 to 9.25**
Eastern Pa.	**9.50 to 10.00**
Pittsburgh	**13.50 to 14.00**
St. Louis	**6.50 to 7.00**

SHEET CLIPPINGS LOOSE

Chicago	**7.50 to 8.00**
Cincinnati	**7.75 to 8.25**
Detroit, dealers	**8.00 to 8.50**
St. Louis	**6.50 to 7.00**

STEEL RAILS SHORT

Birmingham	**11.00 to 12.00**
Boston, dealers	**7.50 to 8.75**
Buffalo	**16.25 to 16.75**
Chicago (3 ft.)	**13.50 to 14.00**
Chicago (2 ft.)	**14.00 to 14.50**
Cinti, deal.	**17.00 to 17.50**
Detroit, deal.	**15.00 to 15.50**
Pitts. (open-hearth, 3 ft. and less)	**17.50 to 18.00**
St. Louis	**14.00 to 14.50**

STOVE PLATE

Birmingham	**10.00 to 11.00**
Boston, con	8.50 to 9.00
Buffalo	**10.25 to 10.50**
Chicago, net	**9.50 to 10.00**
Cinci., deal. net	**7.00 to 7.50**
Det., net, deal.	**9.00 to 9.50**
Eastern Pa.	10.00
N. Y., deal. mill	6.00
St. Louis	**9.00 to 9.50**

COUPLERS, SPRINGS

Buffalo	**16.00 to 16.50**
Chicago	**13.50 to 14.00**
Eastern Pa.	**17.00 to 17.50**
Pittsburgh	**17.50 to 18.00**
St. Louis	**12.50 to 13.00**

ANGLE BARS—STEEL

Chicago	**13.00 to 13.50**
St. Louis	11.25 to 11.75

LOW PHOSPHORUS

Buf., billets and bloom crops	**17.50 to 18.00**
Cleve. bil. and bloom crops	**20.00 to 20.50**
Eastern Pa.	**17.50 to 18.00**
Pitts. billet and bloom crops	**19.50 to 20.50**
Pitts. sheet bar crops	**18.00 to 18.50**

FROGS, SWITCHES

Chicago	**13.00 to 13.50**
St. Louis	**11.50 to 12.00**

SHOVELING STEEL

Chicago	**12.00 to 12.25**
Cleveland	**8.75 to 9.00**
St. Louis	11.00 to 11.50

RAILROAD WROUGHT

Birmingham	**10.00 to 10.50**
Boston, dealers	**7.50 to 8.00**
Buffalo, No. 1.	**10.00 to 10.50**
Buffalo, No. 2.	**13.50 to 14.00**
Chicago, No. 1.	**11.25 to 11.75**
Chicago, No. 2.	**12.00 to 12.25**
Cinti., No. 2	**11.25 to 11.75**
Eastern Pa.	**14.00 to 14.50**
N. Y., No. 1 dl.	**10.00 to 10.50**
Pitts. No. 2	15.25 to 15.75
St. Louis, No. 1	**9.00 to 9.50**
St. Louis, No. 2	**11.00 to 11.50**

SPECIFICATION PIPE

Boston	7.00 to 7.50
Eastern Pa.	12.00 to 12.50
N. Y., deal	**7.25 to 7.50**

BUSHELING

Buffalo, No. 1	**11.25 to 12.50**
Chicago, No. 1	**9.50 to 10.00**
Cinn., No. 1 dl.	**9.25 to 9.75**
Cinn., No. 2	**6.25 to 6.75**
Cleve., No. 2	**8.25 to 8.50**
Detroit, No. 1 new deal	**9.50 to 10.00**
St. L. No. 1	**9.00 to 9.50**
Val. new No. 1	13.75 to 14.25

MACHINE TURNINGS

Birmingham	**7.50 to 8.50**
Boston, dealers	**4.00 to 4.35**
Buffalo	**8.75 to 9.25**
Chicago	**6.25 to 6.75**
Cinn., deal	**7.50 to 8.00**
Cleveland	**7.00 to 8.00**
Detroit	**5.75 to 6.25**
Eastern Pa.	**9.00**
N. Y., deal	**5.00 to 5.50**
Pittsburgh	**8.00 to 8.50**
St. Louis	**6.75 to 7.25**
Valleys	**10.50 to 11.00**

BORINGS AND TURNINGS For Blast Furnace Use

Boston, deal.	**3.10 to 3.60**
Buffalo	**9.25 to 9.75**
Cinn., deal.	**7.75 to 8.25**
Cleveland	**8.75 to 9.00**
Detroit, deal.	6.00 to 6.50
Eastern Pa.	**7.00 to 8.50**
N. Y., deal.	**4.00**
Pittsburgh	**8.50 to 9.00**

CAST IRON BORINGS

Birming. chem.	**12.00 to 13.00**
Birming. plain	**7.50 to 8.50**
Boston, chem.	**9.00 to 9.25**
Boston, deal.	**4.00 to 4.35**
Buffalo	**9.25 to 9.75**
Chicago	7.50 to 8.00
Cinn., deal.	**7.75 to 8.25**
Cleveland	**8.75 to 9.00**
Detroit, deal.	6.00 to 6.50
Eastern Pa.	**8.50 to 9.00**
E. Pa. chem.	**14.00 to 14.50**
N. Y., deal.	**4.50**
Pittsburgh	**8.50 to 9.00**
St. Louis	**9.25 to 9.50**

PIPE AND FLUES

Cinn., deal	**9.00 to 9.50**

RAILROAD GRATE BARS

Buffalo	**9.25 to 9.75**
Chicago, net	**8.50 to 9.00**
Cincinnati	**8.50 to 9.00**
Eastern Pa.	**10.50**
N. Y., deal.	**6.50 to 7.00**
St. Louis	**10.00 to 10.25**

FORGE FLASHINGS

Boston, deal	**7.25 to 7.60**
Buffalo	**11.00 to 11.50**
Cleve. ov. 10 in.	**10.00 to 10.50**
Detroit	**9.50 to 10.00**

FORGE SCRAP

Boston, deal.	**6.00 to 6.50**
Chicago	**14.50 to 15.00**
Eastern Pa.	**12.00**

ARCH BARS, TRANSOMS

Chicago, net	**13.00 to 13.50**
St. Louis	**14.00 to 14.50**

AXLE TURNINGS

Boston, deal.	**6.75 to 7.00**
Buffalo	**11.50 to 12.00**
Chi. steelworks	**9.50 to 10.00**
Cleveland	**11.75 to 12.00**
Eastern Pa.	**11.50 to 12.00**
Pittsburgh	**12.50 to 13.00**
St. Louis	**9.25 to 9.75**

STEEL CAR AXLES

Birmingham	**19.00 to 20.00**
Bos., ship. pt.	**16.50 to 17.50**
Buffalo	**16.00 to 16.50**
Chicago	**16.80 to 17.35**
Eastern Pa.	**21.00 to 21.50**
St. Louis	**16.00 to 16.50**

SHAFTING

Bos., ship. pt.	**13.50 to 14.50**
Chicago	**16.25 to 16.80**
Eastern Pa.	**18.50**
N. Y., deal.	**13.00 to 14.00**
St. Louis	**13.00 to 13.50**

CAR WHEELS

Birming., iron	**10.00 to 11.00**
Boston, iron	**14.00 to 14.50**
Buffalo, iron	**13.50 to 14.00**
Buffalo, steel	**16.00 to 16.50**
Chicago, iron	**13.50 to 14.00**
Chi., roll steel	**14.50 to 15.00**
Cincinnati	**12.00 to 12.50**
Pitts., iron	**15.00 to 15.50**
Pitts., steel	**17.50 to 18.00**
St. Louis iron	**12.00 to 12.50**
St. Louis, steel	**14.00 to 14.50**
E. Pa. steel	**16.75 to 17.00**
E. Pa. iron	**14.50 to 15.00**

NO. 1 CAST SCRAP

Birming., cup	**12.00 to 13.00**
Buffalo (mac.)	**12.50 to 13.00**
Boston, textile	**11.50 to 12.00**
Chicago, mach.	**13.45 to 14.00**
Chi., railroad	**11.20 to 11.75**
Chicago, agri.	**10.90 to 11.50**
Cinn., mach. cup., gross	**17.75 to 18.25**
Cleve. cupola	**13.50 to 14.00**
Det., net deal.	**10.00 to 10.50**
E. Pa. cupola	**13.50**
N. Y. cup. deal.	**9.50 to 9.75**
N. Y., del. loc. foundries	**14.00**
Pitts. cupola	**14.00 to 14.50**
San Fran., del.	**13.50 to 14.00**
Seattle	**14.00 to 14.25**
St. L. No. 1 ma.	**11.50 to 12.00**
St. L. No. 1	**10.50 to 11.00**

HEAVY CAST

Boston	**10.50 to 11.00**
Bos. Mach. cast	**13.50 to 14.00**
Buffalo, break.	**8.50 to 9.00**
Cleve., break	**8.50 to 9.00**
Detroit, auto, net deal.	**11.50 to 12.00**
Det., break., dl.	**7.00 to 7.50**
Eastern Pa.	12.00 to 12.50
N. Y. No. 1 dl.	**8.00 to 8.50**
N. Y. break. dl.	8.25 to 9.10
Pittsburgh	**11.50 to 12.00**

MALLEABLE

Boston, R. R.	**15.00 to 15.50**
Buffalo	**15.00 to 15.50**
Chicago, agri.	**11.75 to 12.25**
Chicago, R. R.	**13.50 to 14.00**
Cinn., R. R. dl.	**15.00 to 15.50**
Cinn., agri., dl.	**14.25 to 14.75**
Cleve., rail	**15.50 to 16.00**
Det. auto deal.	**13.50 to 14.00**
St. Louis, rail.	**10.00 to 10.50**

RAILS FOR ROLLING 5 feet and over

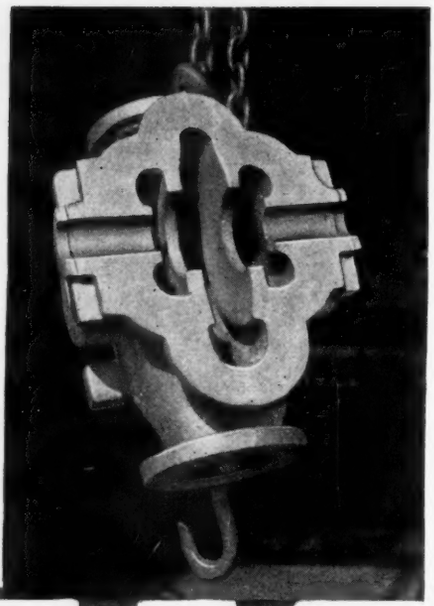
Birming. cup	**12.00 to 12.50**
Boston	**9.00 to 9.50**
Buffalo	**13.50 to 14.00**
Chicago	**14.50 to 15.00**
Eastern Pa	**13.00 to 13.50**
New York	**9.50 to 10.00**
St. Louis	**12.50 to 13.00**

LOCOMOTIVE TIRES

Chicago, cut	**15.00 to 15.50**
St. L. No. 1	**13.00 to 13.50**

LOW PHOS. PUNCHINGS

Chicago	**13.00 to 13.50**
Pittsburgh	**17.50 to 18.00**
Eastern Pa.	**17.00 to 18.00**
Buffalo	**17.00 to 17.50**

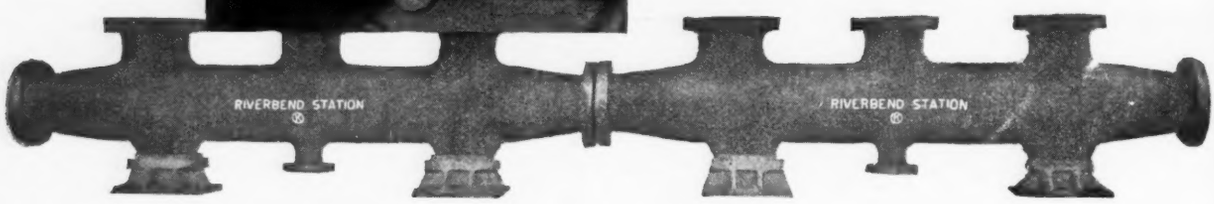


Right: *Keokuk 2% Nickel Steel centrifugal pump casing designed for hot oil at 400 lbs. pressure.*

Below: *3% Nickel Steel super-heated steam headers weighing 6,900 lbs. each, manufactured by* KEOKUK STEEL CASTING CO., *Keokuk, Iowa.*

Dependable materials are the best assurance of dependable performance

SUPER-FITTINGS FOR SUPER-SERVICE



Nickel Steel Castings assure long life under high pressure

THE castings shown in the lower illustration are high pressure super-heated steam headers made for the Duke Power Co. by the Keokuk Steel Casting Company. Each header is 13½ feet long, 20 inches in diameter, weighs 6,900 pounds, and is designed to stand a working pressure of 750 pounds at 900°F.

To assure dependable service and long life under such strenuous operating conditions 3% Nickel Steel is used for these high pressure fittings. The centrifugal pump casing shown above is cast from 2% Nickel Steel.

Nickel Steel castings are being adopted more and more for equipment subject to high working pressures. The exceptional toughness of Nickel Steel, and its strength at elevated temperatures assure an ample factor of safety even under conditions of high temperature and pressure. The same dependable properties which have led to the adoption of Nickel Alloy Steel for highly stressed machinery parts are readily obtained in this type of casting.

Our staff of engineers will gladly furnish detailed information regarding the properties and uses of Nickel Alloy Steels.

Nickel
FOR ALLOY STEEL

Send for "Buyers' Guide to Nickel Alloy Steel Products" and List of Available Publications

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

No. 1 railroad steel. One broker has offered $10, New York, an increase of 30 to 40 cents a ton. Consuming demand in general continues restricted, however.

Buffalo—Little scrap is coming out, although country scrap is accumulating. No. 1 and No. 2 heavy melting steel is coming in freely on barge shipments from the east and there is the usual traffic in boat shipments of hydraulic compressed sheets and drop forge flashings from Detroit.

Pittsburgh—A firm tone continues in steel and iron scrap, aided by restricted supplies of quality material. Dealers are usually offering

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$15.00
Steel axles	13.00
Car wheels	11.00
Stove plate	10.00
Wrought pipe	5.00
Turnings	6.00
Heavy melting steel	8.00

TORONTO

Steel axles	10.00
Iron axles	12.00
Heavy melting steel	9.00
Turnings	6.50
No. 1 mach. cast (net)	11.00
Malleable (net)	9.00

$15.25 and better to cover on contracts for heavy melting steel with $16 reported paid at one point. The average for this grade is $15.50. Compressed sheets are in a strong market but demand is lacking. The Pennsylvania list for September contains 30,375 net tons. Prices on other grades are generally unchanged and steady.

Philadelphia—Demand for steel and iron scrap is spotty but better, with advances in three grades. Heavy breakable cast is up 50 cents, specification pipe at a spread of $12 to $12.50, compared with flat $12 and grate bars 50 cents higher.

Cleveland—Activity in iron and steel scrap is confined mostly to minor yard activity. Steel mill consumers continue out of the market, one having taken no material for the fourth week. The second is well supplied and is receiving sufficient material to augment present supplies through its railroad affiliations. Blast furnace and foundry grades are slow. Prices are nominal and unchanged in the absence of trading, despite higher prices at Pittsburgh and a stronger tone in the Valleys.

Cincinnati—Dealers' quotations on rails for melting have advanced 25 cents for a spread of $12 to $12.50. Other grades of scrap steel are nominally unchanged but firmer. Offerings of heavy melting steel are not plentiful.

St. Louis—The action of steel and iron scrap during the past two or three weeks indicates the downward price trend has definitely terminated, with specific advances on a number of items. Purchasing continues in moderate volume, and is confined to a limited number of special grades for which there exists immediate need. In all such transactions the top figure of the spread is paid.

Boston—While there has been no improvement in sales volume of scrap a distinctly better feeling is based largely on betterment in the Chicago and Pittsburgh markets. Heavy melting steel and axles were firmer.

Detroit—Firmer tendencies show in open-hearth grades of steel scrap, with continued scarcity in heavy melting steel. Blast furnace grades are slower. Prices on cast iron borings and borings and turnings for blast furnace use have been dropped 25 cents a ton.

Birmingham, Ala.—Car lots of steel and iron scrap are moving but the market is slow and prices weak.

Toronto, Ont.—Limited trading continues in steel and iron scrap. Mills are buying small tonnages of heavy melting steel and turnings, but releases against contract are steady. Iron grades are dull.

Republic Declares Dividend

Republic Steel Corp. has declared its regular quarterly dividend of $1.50 a share on preferred stock. It is payable Oct. 1 to stock of record Sept. 12.

Coke

Beehive Production Is Slightly Heavier—Radiator Foundries Are Taking Larger Tonnages

COKE PRICES, PAGE 80

Pittsburgh—New business in beehive coke is dull. Shipments on old orders are light, with blast furnace and foundry operations failing to improve. Spot demand for furnace coke is poor. Radiator companies are taking more foundry coke, but this increase is lacking in other directions. Production is slightly heavier but still seasonally light. Prices are unchanged, but the furnace grades lack a test.

Production of coke in the Connellsville region for the week ended Aug. 16 was 20,790 tons compared with 19,790 tons the preceding week and 96,720 tons in the same period a year ago, according to the *Connellsville Courier*.

Boston—Foundry coke continues to move on contract, with little indications of an improvement. Cooler weather has set in and demand for domestic grades is better. There will be no price increase Sept. 1.

New York—Dullness continues in coke, with beehive furnace going at $2.50, Connellsville, and standard beehive foundry at $3.50 to $3.75, Connellsville, and premium brands at $4.85, Latrobe. By-product foundry coke is $9 to $9.40, delivered Newark; $11, New England; and $9, Philadelphia.

Cincinnati—Somewhat more activity is noted in domestic grades of by-product coke but foundry grades remain dull. Shipments this month may exceed those of July when several foundries closed for vacations.

St. Louis—Since the middle of August there has been a slight increase in the rate of coke shipments, a number of plants preparing to resume or add to operations in September having enlarged their specifications. New orders still lag, and prices are unchanged.

Birmingham, Ala.—Coke shipments are less than the output, independents keeping production adjusted to demands. Steel companies carry some coke in stock. Little tonnage is moving from the district. Prices are steady.

Freight Speed Gains Slowly

Average speed of railroad freight trains is increasing slowly but steadily, according to the Bureau of Railway Economics. In June the average speed was 14 miles an hour between terminals, including all yard and road delays. This compares with 13.9 miles per hour for May and 13.4 miles in June, 1929.

The average load of a freight car in June was 26.6 tons, an increase of one-tenth of a ton from June, 1929, and three-tenths of a ton from June, 1928. Average daily movement of a freight car in June was 28.3 miles, against 32.4 miles in June, 1929, and 30.3 miles in June, 1928.

Pacific Coast

Selling Improves and Prospective Projects Promise Continued Activity—Most Lettings Are Small but Larger Lots Are Figured — Prices Unchanged and Show Firmness

Seattle—In the Pacific Northwest steel markets reflect a firmer tone with activity increasing and demand more pronounced. While small tonnages continue to predominate, not a few important projects are proposed and will be up for figures within 60 days. Awards this week exceed 3000 tons.

Bars, Plates and Shapes

Mill prices remain unchanged. Reinforcing is quoted at 2.30c, merchant bars and shapes at 2.25c and plates at 2.15c to 2.25c.

Reinforcing awards this week totaled 1450 tons. Pacific Coast Steel Co., Seattle, booked 1000 tons for the substructure of an addition to the American Can Co. plant, Seattle, through Henry & McFee, subcontractors. Northwest Steel Rolling Mills, Seattle, took 350 tons for the 12-story Larsen building at Yakima, Wash., and 100 tons required in remodeling a garage building at Second and Spring streets, Seattle. Pacific Coast Steel Co., Seattle, also has a small award for the Mt. Baker Center building, Seattle. Tonnages pending include 2000 tons for the Burrard street bridge, Vancouver, B. C., bids Oct. 31, and an unstated tonnage for piers and abutments of the Lillooet bridge, British Columbia, for the Pacific Great Eastern railroad.

Puget Sound Machinery Depot, Seattle, has the contract for a large boiler for the White River Lumber Co., Enumclaw, Wash., requiring 100 tons of plates, shapes, tubes and castings.

Joseph T. Ryerson & Son Inc., Chicago, has been awarded 290 tons of shapes for hangars and station buidings at Iowa City, Iowa., North Platte, Nebr., Elko, Nev., Rock Springs, Wyo., and Omaha, Nebr. The general contract is held by the Austin Co., Cleveland, the new buildings being for Boeing Air Transport Inc. The Austin Co. also has the general contract for a $100,000 creamery plant for the Dairymen's Co-operative at Boise Valley, Idaho. The project requires 115 tons of structurals. Dominion Bridge Co., Vancouver, B. C., has been awarded an unstated tonnage of structurals for the Lillooet bridge for the Pacific Great Eastern railroad, British Columbia. Bids for the Burrard street bridge, Vancouver, B. C., calling for 3200 tons of structurals, will be received by City Clerk William McQueen, Oct. 31. The Hoh river, Wash., bridge requires 300 tons, bids Sept. 2.

Pipe Awards Are Few

The only award of the week involved 100 tons for the Indian School at Tacoma, Wash., taken by the American Cast Iron Pipe Co. Several projects are pending, the largest being Anacortes, Wash., bids Sept. 5, to include alternate tenders for cast iron, concrete and wood stave.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Building Is More Active

San Francisco—(*By Air Mail*)—Some improvement in demand for iron and steel products on the Pacific Coast is noted, structural steel shapes and reinforcing bars being the most active.

Featuring the awards of the week were 1000 tons of plates for tanks for the Procter & Gamble plant at Long Beach, Calif., 2000 tons and 1200 tons of structurals respectively, for a plant at Maywood, Calif., and a warehouse in Los Angeles. Little change is noted in prices, quotations holding fairly firm to levels established a few weeks ago.

Bars, Plates and Shapes

Several concrete bar tonnages were placed, the total being the second largest in over six weeks, aggregating 1058 tons. An unnamed interest took 300 tons for a warehouse for the Brunswig Drug Co., Los Angeles, and 200 tons for a garage on South Hope street, Los Angeles, for the Southern California Edison Co. A hotel addition in Pasadena, 300 tons, was secured by the Soule Steel Co. A large volume of pending business, exceeding 8500 tons, is expected to be closed within the next few weeks. Bids open Sept. 15 for 301 tons for the Atlantic street bridge, Los Angeles. No change in out-of-stock quotations has been reported, 2.50c, base, applying on carload lots in the San Francisco district.

The Western Pipe & Steel Co. took 1000 tons for tanks at Long Beach for the Procter & Gamble plant. Prices range from 2.15c to 2.25c, c.i.f. Coast ports.

Awards of structural steel shapes aggregated 5492 tons, the largest weekly total in over six weeks. To date this year 78,863 tons have been placed as compared with 123,908 tons for the corresponding period last year. The Consolidated Steel Corp. took 2000 tons for its own plant at Maywood, Calif., 250 tons for a factory at Trona, Calif., and 750 tons for a garage for the Southern California Edison Co., Los Angeles, Mcclintic-Marshall Co. secured 1200 tons for a warehouse for the Brunswig Drug Co., Los Angeles, and the Moore Drydock Co. booked 400 tons for Pier No. 1, San Francisco.

New inquiries include 560 tons for the Atlantic avenue bridge, Los Angeles, bids on which will be opened Sept. 15. Plain structural material remains unchanged and ranges from 2.15c to 2.25c, c.i.f.

Demand for cast iron pipe was confined to lots of less than 100 tons, the total being less than 400 tons. Bids were opened on 783 tons for Glendale, Calif., the National Cast Iron Pipe Co. being low bidder.

Concrete Inquiries

(*Concluded from Page 77*)

tion Park, Los Angeles; bids being received.
450 tons, subway, route 107, section 8, Lafayette street, Brooklyn, N. Y.; bids early in September.
301 tons, Atlantic street bridge, Los Angeles; bids Sept. 15.
250 tons, Bronx parkway extension, Westchester County Park commission; bids Sept. 2.
150 tons, apartment, Argyle street, Los Angeles; bids being taken.
150 tons, apartment, Sixth and St. Louis streets, Los Angeles; bids being taken.
150 tons, Senn high school, Chicago.
120 tons, including mesh, telephone building, Newark, N. J., to Faitoute Iron & Steel Co., Newark, N. J.; White Construction Co., general contractor.
100 tons, 2-story packing house, Cleveland Provision Co., West Sixty-fifth street, Cleveland; L. L. Maines, Cleveland, architect; bids to be asked in September.
100 tons or more, piers and substructure, bridge at Lillooet, B. C., for Pacific Great Eastern railway; bids immediately.
100 tons, International house, University of Chicago, Chicago.
100 tons, Hearthstone Home apartment, Chicago.
100 tons, bridge work for Outer drive, Chicago.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2 points less. Wrought iron pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal
½	58	44½	½	23	5
¾	62	50½	¾	28	11
1—3	64	52½	1 and 1¼	31	15
			1½ and 2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7 and 8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7 and 8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

SEAMLESS TUBING

Cold drawn; f.o.b. mill

Random lengths over 5 ft.....55%
Selected lengths, 1 to 18 ft.....53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. $37.00 to 38.00
Four-inch, Birmingham 41.00 to 42.00
Four-inch, Chicago ..... 49.20 to 50.20
Six to 24-inch, Chicago 45.20 to 46.20
Six-inch and over, N. Y. 38.50 to 40.50
Four-inch, New York .... 41.50 to 42.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.85c
Detroit	3.00c
Houston	3.00c
Los. Ang.	3.40c
New York††	3.10c
Philadelphia	2.70c
Pittsburgh	2.75c
Portland	3.15c
San Frans.	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.15c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York††	3.10c
Philadelphia	2.70c
St. Louis	3.15c
Tulsa	3.65c

REINFOR. BARS

Baltimore	2.50c-3.31c
Boston	2.665c
Buffalo	2.95c
Chattanooga	3.10c
Cincinnati	3.15c
Cleveland	2.25c-2.44c
Detroit	2.30c-3.00c
Houston	3.00c
Los Ang. cl	2.40c
Los Ang. lcl	2.70c
New York	2.65c-3.10c
Philadelphia	2.55c
Pittsburgh	2.75c
San Fran. cl	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los. Ang.	3.40c
New York	3.10c
Philadelphia	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New York	3.30c
Philadelphia	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.75c

NO. 10 BLUE

Baltimore	3.50c
Bost. 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.10c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
New York	3.40c
Portland	4.00c
Phila. *†	3.15c
Pitts.**	3.10c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.545c
Tulsa	3.95c

NO. 24 BLACK

Balt. *†	3.75c
Boston	4.70c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Clev. ***	3.75c
Detroit	3.95c
Los Ang.	4.70c
New York	3.55c to 3.65c
Phila. *†	3.75c
Pitts. **	3.65c
Portland	5.00c
San Fran.	4.35c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.45c

NO. 24 GAL. SHEETS

Balt.*†	4.25c
Boston	5.45c
Buffalo	4.40c to 4.60c
Chicago (lc. del.)	4.60c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.35c
Detroit	4.40c
Houston	5.40c
Los Ang.	5.10c
New York	4.25c
Phila. *†	4.25c
Pitts.**	4.20c
Portland	5.50c
San Fran.	5.00c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.35c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.50c
Chattanooga	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.10c
Det. 3/16-in. & lighter	3.30c
Houston	3.65c
Los Ang.	4.30c
New York	3.40c
Philadelphia	3.00c
Pittsburgh	3.10c
Portland	3.50c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.35c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.65c
Det. No. 14 & lighter	3.80c
New York	3.75c
Philadelphia	3.25c
Pittsburgh	4.10c
Seattle	5.15c
St. Paul	3.90c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.50c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San. Fran.(a)	4.25c
Seattle (a)	4.75c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100-in 500 lbs. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
New York	5.05c
Phila. (c)	4.95c

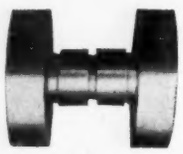
(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

††Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

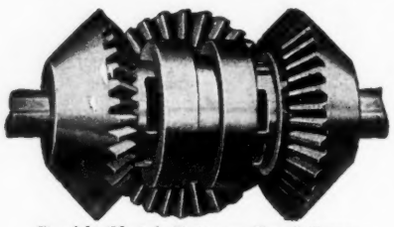
THE JOHNSON FRICTION CLUTCH

STOP HAVING A LOT *of* CLUTCH TROUBLE!

USE The SUPER--JOHNSON!



Double Clutch with Pulleys Mounted on Hubs



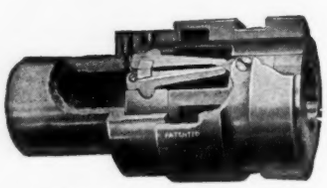
Double Clutch Between Bevel Gears

IMPROVED- MODERNIZED- VERY COMPACT--

A SIMPLE CONSTRUCTION— A SAFETY CLUTCH——WITH AN ADJUSTMENT THAT "STAYS PUT"

Single Clutch with Pulley

Single Clutch, Exterior



Single Clutch, Sectioned

Double Clutch—Exterior

WIRE, PHONE Or WRITE FOR CATALOG "WHITE-8"

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 11.00c, del., Conn. for copper

Sheets	
Yellow brass (high)	17.87½
Copper, hot rolled	20.75
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-lb. base)	9.50
Tubes and Pipes	
Seamless yellow brass (high)	22.75
Seamless copper	23.00
Rods	
Yellow brass (high, full turnings)	16.12½
Naval brass	19.00
Anodes	
Copper, untrimmed	18.25
Wire	
Yellow brass (high)	18.37½

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	7.25 to 7.50
Chicago	7.00 to 7.50
Cleveland	8.00 to 8.50
St. Louis	7.50 to 8.00
Heavy Yellow Brass	
Cleveland	5.00 to 5.75
Heavy Copper and Wire	
New York	8.50 to 8.75
Boston	8.50 to 8.75
Chicago	8.75 to 9.00
Cleveland	8.00 to 8.50
St. Louis	8.25 to 8.50
Red Brass Borings	
New York	6.75 to 7.25
Yellow Brass Tubing	
Cleveland	5.00 to 5.75
Light Copper	
New York	7.00 to 7.50
Chicago	6.75 to 7.00
Cleveland	7.50 to 7.75
St. Louis	8.00 to 8.25
Light Brass	
Boston	4.00 to 4.25
Chicago	4.50 to 5.00
Cleveland	3.50 to 4.00
St. Louis	4.50 to 4.75
Zinc	
New York	2.25 to 2.50
Cleveland	1.75 to 2.00
St. Louis	2.25
Aluminum	
Clippings, soft, Cleveland	12.00 to 13.00
Clippings, hard, Cleveland	9.00 to 9.50
Borings, Cleveland	5.00 to 6.00
Cast, Cleveland	7.00 to 8.00
Cast, Boston	7.00 to 7.50
Cast, St. Louis	7.50

Secondary Metals

Remelt aluminum No. 12	14.00 to 15.00
Brass ingot, 85-5-5-5	11.00

Quicksilver Is Easy

New York—Quicksilver is easy at $118 to $119 a flask.

Metals

Trading Continues Quiet and Prices Remain Fairly Firm—Tin Eases Off, However

New York—Nonferrous metals are passing through a period of exceptional quietness. Neither buyers nor sellers show much trading interest, and so prices in the past week have been fairly steady.

It is generally said that business will be more active in September, but so far there is little tangible evidence to back this view. Faith is based largely on the idea that consumption is larger than current purchases, and so buying will increase as present commitments are run through. Only a little increase in demand would bring greater price firmness, it is said by many market men, and this is applied especially to zinc.

Copper—Business has been done in extremely light volume both at 11.00c and 10.75c, Connecticut. The higher figure continues to be the general asking price. In one or two places, however, it is sometimes possible to do business at less on bid, depending on conditions among custom smelters at the time of the bid. It appears as if no large quantity could be had under 11.00c, but on the other hand users are well covered on their needs at least through October and so it is only small quantities that are wanted. Some users have been bidding low prices and refusing to buy except as they could get metal under 11.00c. Product prices and old metal prices are unchanged in light transactions.

Zinc—Prime western eased off to 4.30c, East St. Louis, and it is probable this price could be shaded in one or two places on bids for small quantities for prompt shipment. Most smelters are indifferent and not pushing the market. In a limited way they will meet the market for regular customers. Any increase in buying probably would send the price up as it did a month or so ago, but users do not appear to be in immediate need of metal. Some producers have been in the market lately as buyers.

Tin—Prices held remarkably steady for several days around 30.00c, as in the previous week, but in the past day or two the continued lack of demand has caused prices to sag slightly. Stocks still are accumulating in England at the rate of several hundred tons a week.

Aluminum—New business is small but prices are steady.—*Daily Metal Trade.*

Coke By-Products Steadier; Distillates More Active

New York—Light oil distillates are more active, especially benzol and toluol. The automobile and artificial leather trades are taking larger volume. Coking operations have been curtailed and stocks are not large.

Phenol demand is light, although stocks are not piling up because of lighter output. Some phenol is moving at New York at 17.00c and even higher on the best qualities. Naphthalene buying is limited to spot demand and this is expected to continue until contracting starts late in the year. Prices are steady and unchanged. Contract prices on sulphate ammonia to the fertilizer trade are yet to be announced, the delay being due to foreign influences. Meanwhile prices are unchanged with some shading of $1.90.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots	**Spot**
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.15 to 0.16
Per Pound at Producers' Plants	
Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½
Per 100 Pounds Delivered	
Sulphate of ammonia	$1.90

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
Aug. 20	10.75	11.07½	10.62½	30.00	30.37½	5.50	5.35	4.30	22.90	7.75	35.00
Aug. 21	10.87½	11.07½	10.62½	30.00	30.37½	5.50	5.35	4.30	22.90	7.75	35.00
Aug. 22	10.87½	11.07½	10.62½	30.00	30.37½	5.50	5.35	4.30	22.90	7.75	35.00
Aug. 23	10.87½	11.07½	10.62½	.....	.....	5.50	5.35	4.30	22.90	7.75	35.00
Aug. 25	10.87½	11.07½	10.62½	29.75	30.12½	5.50	5.35	4.30	22.90	7.75	35.00
Aug. 26	10.87½	11.07½	10.62½	29.62½	30.00	5.50	5.35	4.30	22.90	7.75	35.00

Europe

Vacation Month Adds to Dull Condition—Large Rail Order Placed—Belgian Trade Quiet

London—August being the principal vacation month in Great Britain and on the Continent, this seasonal influence is an added factor to the quiet conditions prevailing in the iron and steel export trade. In Great Britain the general outlook is despondent, and little business is being done in pig iron, although it is reported from France that some competition is being experienced from British producers. Lowering of prices on the part of continental comptoirs enables French and Belgian billets to be delivered in the Birmingham district at the low price of £5 4s 3d ($25.35), against the British domestic price of £5 17s 6d ($28.59). Continental merchant bars can be obtained in the Birmingham district at about £5 15s ($27.98), delivered, and beams at about £6 ($29.20). As a result of these low prices, a small amount of buying has been effected by British users and merchants. Dorman, Long & Co. Ltd., Middlesborough, have been awarded the contract for a new bridge to be built over the Nile at Cairo.

On the Continent there was a spurt of activity at the end of July, following price cuts made by the comptoirs, but this revival was short-lived and the most recent reports are to the effect that export trade on the continent has resumed the dullness that now has been prevailing for many weeks. Export prices for ship plates, black sheets, galvanized sheets and bands and strips have further fallen off, a decrease of from 2s 6d to 5s (60c to $1.21) being registered in most cases. While, as mentioned above, British producers are competing on the Continental pig iron market, it also is reported that some Continental pig iron is making inroads in Scotland, where it has to meet Indian competition.

It is reported from Germany that an order for two tank locomotives for the Burma Railways in India has been received by Hanover Maschinenbau, A. G., of Hanover-Linden, and an order for 14,600 locomotive steel boiler tubes has been placed with the English representatives of the Pheinmetall Syndicate of Germany.

Middlesbrough Shipments Regain Some Lost Ground

Birmingham, Eng.—Iron and steel shipments from Middlesbrough in July recovered slightly from the low point touched in June. The aggregate tonnage of iron and steel shipments was 71,345, compared with 57,546 in June. The total pig iron shipped was 16,796 tons, compared with 12,456 in previous month and out of this total 7542 tons went abroad. The largest buyer of Middlesbrough pig iron was Italy, taking 2020 tons, and France 1055 tons. With the exception of 500 tons to Australia, most of the iron was shipped to near Continental countries. Over 5000 tons of east coast iron was sent to Scotland.

Manufactured steel exports totaled 50,936 tons, against 41,016 in June. Foreign shipments totaled 35,687 tons and the second largest buyer was the Argentine taking 7489 tons. The Union of South Africa took 9556 tons and India 4326 tons. The Indian shipments are much below normal and represent a drop of 1100 tons compared with June.

Only 2094 tons of finished iron went to foreign ports, and of this total the Straits bought 1105 tons.

European Markets Quiet; 35,000 Tons of Rails Placed

London — (By Cable)— British iron and steel markets continue dull, Middlesbrough works are closed. This being the race week holiday the stagnation of business has been forgotten temporarily. The recent reduction in pig iron has not stimulated orders, but larger buying is expected next week. Prospects for shipbuilding have improved. Midland railmakers and freight car builders report fair output, especially for export. Steel competition from the Continent is severe. In France pig iron stocks are accumulating; imports in the first half of the year increased to 90,000 tons. Works are seeking orders for finished steel. In Germany iron and steel production in July was much lower than in June. Steelworks continue to lay off employes. Specifications for railroad material are heavier In Belgium railroads have placed orders for 35,000 tons of rails. Prices of some commodities are the lowest since 1913. Scrap is firmer and the tone of the domestic market is better.

Steel Entente's Life May Hinge on Lower Prices

Brussels—The seasonal effect of the summer months is adding its influence to the general sluggish conditions, and trade on the Belgian iron and steel market continues dull. At the end of July there was a certain amount of activity on the Brussels iron and steel exchange and a substantial volume of orders for rolled steel was passed, in which German buyers took a considerable part. This resulted in an increase in the price of merchant bars from £4 10s ($21.75) to £4 11s ($22) and even £4 12s 6d ($22.40). Sellers would offer no options for forward business. Since the beginning of the month, however, conditions have resumed a dull aspect, and at the meeting of the exchange Aug. 6 little business was transacted and the price of merchant bars dropped to £4 10s ($21.75). A few orders were passed for hoops and bands at between £5 5s ($25.40) and £5 7s 6d ($26). It is impossible to fix the basis price, as these orders were for sundry sizes and tonnages.

The price for beams, as fixed by the entente, now is £4 16s ($23.25) for standard shapes and £4 18s ($23.70) for British sizes, but practically no business was done, as considerable orders were taken during the second half of July, probably at prices below those fixed by the entente. It is reported that during that period 75,000 tons of structural steel were placed. For some time past there has been little demand for small angles. It is stated that a drop of 15s to 20s ($3.65 to $4.86) has occurred, and these small angles have been offered as low as £9 ($43.50) per ton. There is little demand for special sections, and rolling mills which specialize in this kind of work are badly in need of orders.

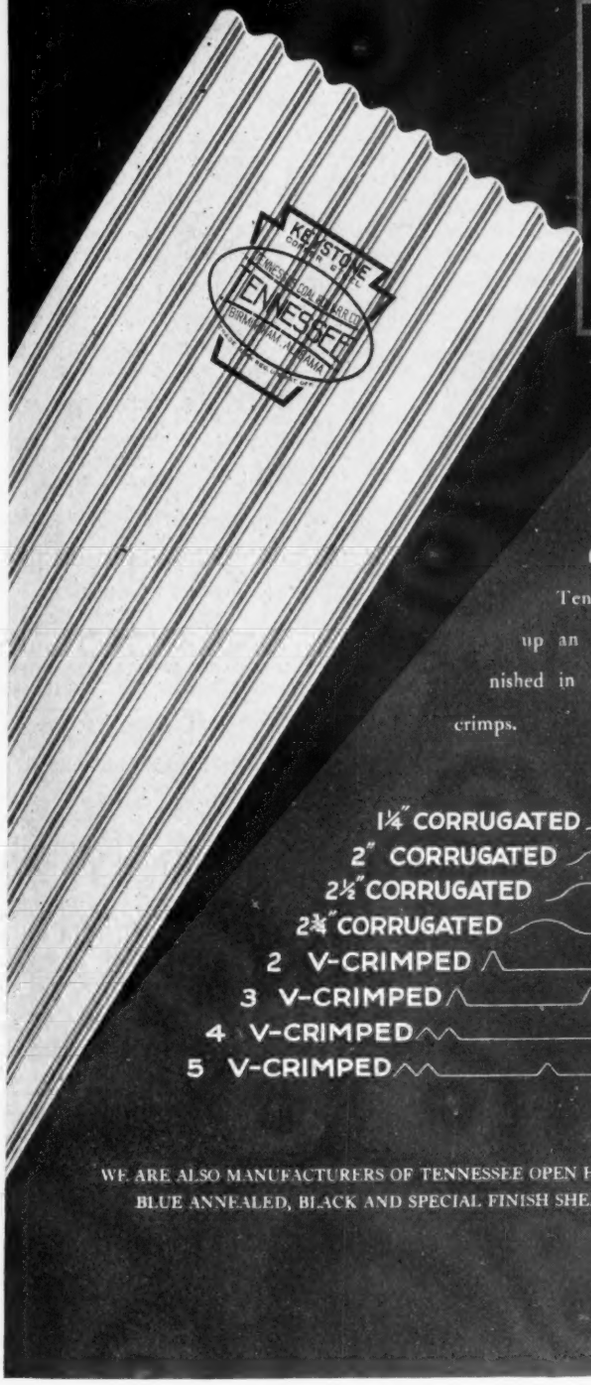
The pig iron market is weak. Practically no business has been transacted on the Brussels exchange for semifinished steel, but this is probably due to the fact that the new policy of the entente considerably restricts the possibilities of merchants doing business in this line.

There have been new meetings of the comptoirs for semifinished steel and structural steel, and it is hoped that a final arrangement soon will be arrived at. There still are a few points to be settled between the

TENNESSEE

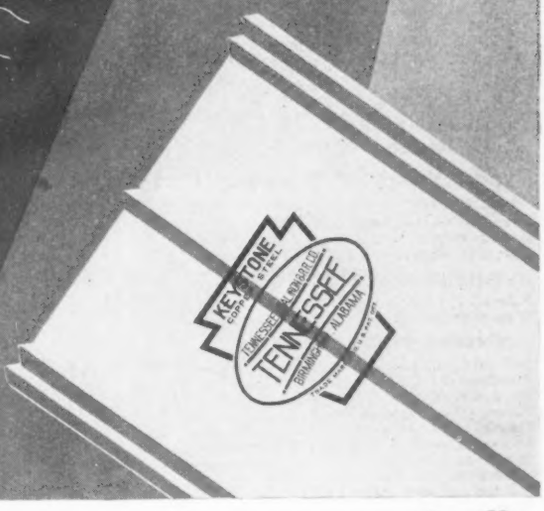
KEYSTONE COPPER STEEL SHEETS

Black - Galvanized - Formed



Produced on modern mills and manufactured with an emphasis on quality, Tennessee Galvanized Sheets have built up an enviable reputation. Can be furnished in the following corrugations and crimps.

1¼" CORRUGATED
2" CORRUGATED
2½" CORRUGATED
2¾" CORRUGATED
2 V-CRIMPED
3 V-CRIMPED
4 V-CRIMPED
5 V-CRIMPED



WE ARE ALSO MANUFACTURERS OF TENNESSEE OPEN HEARTH BLUE ANNEALED, BLACK AND SPECIAL FINISH SHEETS

Tennessee Coal, Iron & Railroad Company

General Offices: Brown-Marx Building, Birmingham, Ala.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
CARNEGIE STEEL COMPANY
COLUMBIA STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPB'LDG. & DRY DOCK CO.
ILLINOIS STEEL COMPANY
NATIONAL TUBE COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & RAILROAD CO.
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors — Columbia Steel Company, Russ Bldg., San Francisco, Calif.

Export Distributors—United States Steel Products Company, 30 Church St., New York, N.Y.

French and the Belgians. The German and Luxemburg steelmakers are in agreement with the proposed regulations. It is feared, however, that the German government may create certain difficulties, as the German chancellor, in view of the considerable increase in unemployment, is striving to bring down prices and to some extent control the workings of such organizations as the selling syndicates. It is reported that if the steel entente does not further bring down prices, the German chancellor would consider the dissolution of the entente on the plea that it is interfering with the normal run of business. This is rather an improbable event, but should it happen it would be the beginning of the end of the international entente.

Locomotive Builder Idle

Berlin—The report of the Henschel concern at Cassel for 1929 shows a gross profit of 658,247 marks ($157,000). This concern operates collieries, a foundry and a locomotive works, the latter department being the most important of the enterprise. According to the report, the concern, like many others, is experiencing a severe crisis, and is felt that there is overprdouction in the manufacture of locomotives, and already several works in Germany have been closed down. In 1929 the company supplied to the Reich railroad only one small locomotive and three tenders. Toward the end of the year the Reich railroad ordered 18 locomotives and 11 tenders, which is obviously a small order.

It was reported that export sales were mostly effected at a loss. The concern also manufactures automobiles and motor buses, and these enjoyed more favorable sales.

German Foreign Trade Is at Low Mark

Berlin—A considerable drop in the tonnage of iron and steel exported from Germany was registered in June. The previous low point was in March, 1929, with 319,172 metric tons, but at that time German business still was handicapped by the Ruhr strikes. The tonnage of scrap exported amounted to 21,031 metric tons. The principal imports in June consisted of merchant bars, hoops and bands, 42,992 tons. These imports also included 9999 tons of scrap. Comparisons follow, in metric tons:

	— Imports —		— Exports —	
Mon. ave.	Pig iron and ferro-alloys	Other iron and steel	Pig iron and ferro-alloys	Other iron and steel
1927	23,895	217,505	29,910	347,645
1928	25,535	174,250	24,585	394,575
1929	14,765	137,435	36,115	448,330
1930				
Jan.	22,004	105,127	33,153	488,245
Feb.	13,597	98,397	24,271	409,822
March	16,777	107,401	25,983	465,166
April	12,032	113,195	18,364	405,633
May	16,070	114,548	23,164	439,791
June	13,669	88,342	18,814	341,828

German Steelmaker Finds Business Shrinking

Berlin—Output figures of the Vereinigte Stahlwerke, A. G., the United Steelworks Corp. of Germany, for the two quarters January to March and April to June, 1930, and total figures for the first three quarters of the financial year from October, 1929, to June, 1930, with comparative figures for the corresponding period of the previous year are given in the accompanying table. On June 30, 1930, orders on books of the various works was about 51.9 per cent of the average monthly volume for the financial year 1928-29. Comparisons follow:

	Jan.-March 1930	April-June 1930
	Output (Metric tons)	
Coal	6,679,610	5,926,550
Coke	2,435,312	2,156,503
Pig iron	1,477,951	1,140,815
Raw steel	1,564,884	1,185,859
	Turnover (Marks)	
Domestic trade	206,893,249	180,435,453
Foreign trade	122,499,347	109,260,928
Total	329,392,596	289,696,381

	Oct., 1928 to June, 1929	Oct., 1929 to June, 1930
	Output (Metric tons)	
Coal	19,828,050	19,956,890
Coke	6,917,675	7,249,005
Pig iron	4,327,517	4,276,208
Raw steel	4,723,876	4,456,269
	Turnover (Marks)	
Domestic trade	651,797,149	606,614,694
Foreign trade	383,983,923	368,769,580
Total	1,035,781,072	975,384,274

Number of men

	June 30, 1929	March 31, 1930	June 30, 1930
Total	176,207	169,336	154,315
In the collieries	85,608	82,514	74,442

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, August 25

Export Prices f. o. b. Ship at Port of Dispatch—By Cable

	British Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
PIG IRON	£ s d		£ s d		£ s d		£ s d	
Foundry No. 3, Silicon 2.50-3.00	$15.46	3 3 6	$14.61	3 0 0	$14.61	3 0 0	$14.61	3 0 0
Basic-bessemer	15.95	3 5 6	13.39	2 15 0	13.39	2 15 0	13.39	2 15 0
Hematite, Phosphorus 0.02-0.05	17.29	3 11 0	24.82	630*	.....	.....	17.78	3 13 0
SEMIFINISHED STEEL								
Billets	$28.85	5 18 6	$21.18	4 7 0	$21.18	4 7 0	$21.18	4 7 0
Wire rods	41.40	8 10 0	30.44	6 5 0	30.44	6 5 0	30.44	6 5 0
FINISHED STEEL								
Standard rails	$40.18	8 5 0	$31.66	6 10 0	$31.66	6 10 0	$31.66	6 10 0
Merchant bars	1.74c	8 0 0	.99c	4 10 0	.99c	4 10 0	.99c	4 10 0
Structural shapes	1.68c	7 15 0	1.06c	4 16 0	1.06c	4 16 0	1.06c	4 16 0
Plates, ship, bridge and tank	1.79c	8 5 0	1.19c	5 8 6	1.19c	5 8 6	1.22c	5 10 6
Sheets, black, 24 gage	2.17c	10 0 0	2.09c	9 9 9	2.09c	9 9 9	2.06c	9 7 6
Sheets, galvanized, 24 gage, corrugated	2.47c	11 7 6	2.46c	11 3 9	2.46c	11 3 9	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.10c	5 0 0	1.10c	5 0 0	1.10c	5 0 0
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.43c	6 10 0
Galvanized wire, base	3.04c	14 0 0	1.57c	7 2 6	1.57c	7 2 6	1.57c	7 2 6
Wire nails, base	2.39c	11 0 0	1.38c	6 5 0	1.38c	6 5 0	1.38c	6 5 0
Tin plate, base box 108 pounds	$ 4.38	0 18 0	.....	.....	.....	.....	$ 9.01	1 17 0

*France

Domestic Prices at Works or Furnace—Last Reported

		Francs		Francs		Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$15.46	$19.31	490(2)	$16.80	600	$19.84	83
Basic pig iron	15.95	20.69	525(1)	13.44	480	21.15	88.50
Furnace coke	3.29	6.62	168	5.74	205	5.14	21.50
Billets	28.85	22.26	565	21.00	750	28.08	117.50
Standard rails	1.79c	1.46c	810	1.62c	1,245	1.47c	136
Merchant bars	1.74c	1.18c	655	1.07c	820	1.48c	137
Shapes	1.84c	1.26c	700	1.18c	910	1.45c	134
Plates, ship, bridge and tank	1.95c	1.46c	810	1.33c	1,025	1.65c	153
Sheets, black, 24-gage	2.28c	2.72c	1,510	2.54c	1,950	1.36c	126
Sheets, galvanized 24 gage, corrugated	2.58c	3.52c	1,955	2.60c	2,000	3.67c	340
Plain wire	2.06c	2.03c	1,125	2.15c	1,650	2.34c	217
Bands and Strips	2.17c	1.33c	740	1.43c	1,100	1.72c	159

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.17) f. o. b. Ferromanganese £19 6s 0d ($93.99) delivered Atlantic seaboard, duty-paid. German ferromanganese £12 5s 0d ($59.66) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

Machinery

RISING optimism in machinery circles is the feature of this week which is more generally evident than at any time since last winter. This is primarily due to a marked increase in inquiry, although orders and rumors of orders are in evidence here and there. Amtorg Trading Corp. continues to buy equipment for Russian truck and tractor plants, and a few orders are being received from other European countries. Such orders as are received are in most cases being shipped from stock, but as machine tool builders generally are carrying minimum stocks, it is probable that sales activity will result in a resumption of production.

New York—Inquiry for several lists and the closing on one has brightened the machine tool market. Scattered buying and inquiring is slightly more active. While some builders feel the improvement is not general, optimistic sentiment has been stimulated.

Eighteen tools are wanted by the American Locomotive Co. for Schenectady and its Auburn subsidiary, these including seven radial drills, a planer, boring mill equipment and lathes. Most of this equipment is of the heavier type. Two lists were issued, the bids being in on the needs for the Auburn plant. The Westinghouse service station at Newark is inquiring for 10 tools and eastern shipyards are also buying in a limited way. Interests is also revived in some long-pending business which may be closed this fall. While some of the largest buyers of machine equipment are out of the market indefinitely, recent inquiry is decidedly welcome after several months of low-ebb volume. Several dealers and buildings note a pronounced increase in inquiry.

Several of the largest ball bearing producers are operating four days a week and in volume at about the 1927 rate. Increase in capacity since that period, however, brings the percentage rate of operations down. It now develops that Amtorg has been buying for a truck and tractor plant in Russia and while a fairly large volume has already been placed, more equipment still remains to be bought. Grinding machinery is more active in spots. A Pennsylvania builder is reported to have taken considerable business for Russia. Another notes a steady export demand with Europe, although no improvement is noted for domestic requirements.

Worcester, Mass.—The machinery market is showing signs of improvement. Drilling machinery and lathes are in better demand though of course no great buying movement is underway. With the close of the vacation season now at hand, production is expected to assume a steadier tone. Grinders, an important feature of the local market, are still weak. Small tools are reported in little demand.

Pittsburgh—The machine tool market as yet has not emerged from its summer quietness and inquiry is slow to improve. Tool sales remain scattered, with orders for individual tools predominating. Most of the larger companies such as Westinghouse Electric & Mfg. Co. and large steel producers, are continuing original programs with regard to equipment purchases, and cancellations and holdups on the part of other companies are fewer than earlier in the summer. Builders of heavy steel mill equipment remain well engaged, and Westinghouse Electric is busy on electrical equipment for the Illinois Steel Co.'s expansion program.

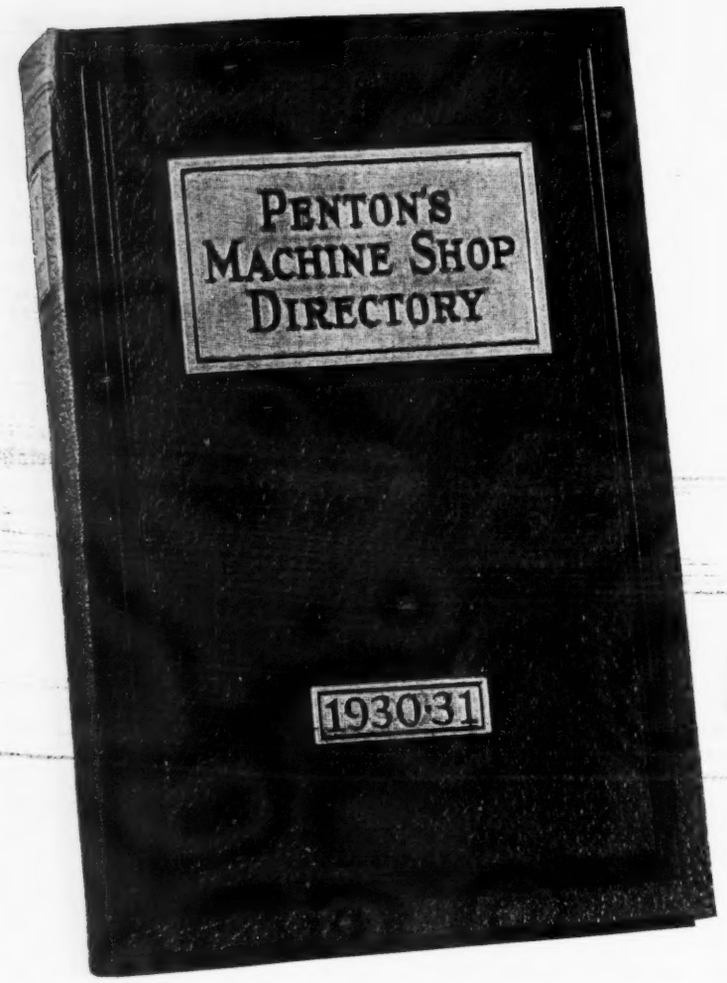
Cleveland—The more optimistic feeling which is evident this week in other industrial centers, is clearly reflected in the Cleveland machine tool situation. Here, as elsewhere, the feeling is inspired by a livening up of inquiry rather than an active revival of sales—although a promising number of orders for single machines is reported. The situation as far as inquiries are concerned is well expressed by one of the large Cleveland builders of production machine tools, who reports that his sales engineering department is, for the moment at least, "snowed under" by the quotations called for.

Employment remains at a low ebb, such machine tools as are sold being shipped from stock. Increasing activity is reported in tool and die making, however. The fact that few, if any, machine tool builders were caught by this present slump with more than minimum stocks on hand, holds favorable employment possibilities.

Chicago—While pessimism has not become the keynote of machine tool dealers here, dragging business none the less defers the occurrence of any distinct upward trend. Even the most optimistic foresee no marked improvement until October. Inquiries and specifications, as has been the recent condition, continue to be received in fairly large numbers. However, actual awards are another story, being few in number. One machinery dealer here has reported a fairly good week as far as sales go, but his experience is decidedly the exception. Western Electric Co. tool and die shops are on a restricted level and, perhaps contrary to better judgment, industries generally are exhibiting a tendency to defer replacement of machinery until resumption of better general business conditions. No really sizable inquiries can be pointed out and inquiry are few and orders less.

Exports of Metalworking Machinery

	July		January through July	
	1930	1929	1930	1929
Engine lathes	128	72	849	519
Turret lathes	35	43	315	325
Other lathes	39	64	485	553
Vertical boring mills and chucking machines	80	20	221	158
Thread-cutting and automatic screw machines	36	114	459	591
Knee and column type milling machines	25	24	224	254
Other milling machines	65	44	515	421
Gear-cutting machines	27	55	289	303
Vertical drilling machines	23	40	356	255
Radial drilling machines	15	10	137	73
Other drilling machines	91	451	1,146	1,373
Planers and shapers	14	42	254	302
Surface grinding machines	6	28	149	144
External cylindrical grinding machines	56	76	406	485
Internal grinding machines	8	30	247	280
Tool grinding, cutter grinding, and universal grinding machines	208	96	1,174	937
Pneumatic portable tools	1,815	2,844	12,354	15,134
Chucks for machine tools	1,135	2,545	17,131	12,662



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133-X

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

HARTFORD, CONN.—Terry Steam Turbine Co., 874 Windsor street, has awarded contract for a 2-story plant addition which will cost about $40,000.

HARTFORD, CONN.—Municipal aviation commission, Hiram P. Maxim, chairman, is considering enlargement of Brainard field to 520 acres, twice the present size. Terminal buildings, hangar units, and a seaplane base in the Connecticut river are included in tentative plans.

BOSTON—School department will purchase automobile mechanics equipment for New Brighton high school.

EVERETT, MASS.—New England Fuel & Transportation Co. advises through O. R. Kroell, repair and maintenance engineer, that the boiler house addition for Mystic Iron Works, recently noted, will be 22 x 60 feet. One 814-horsepower water-tube three-drum boiler, two fans, two stokers, and controller equipment will be installed. (Noted Aug. 14.)

SPRINGFIELD, MASS.—New York, New Haven & Hartford railroad, Grand Central terminal, New York, has authorized installation of a gantry crane in its Taylor street yard here.

WORCESTER, MASS.—Fowler Oil Burner Co. Inc., 19 Union street, advises through John H. Ruth, vice president and general manager, that the company has entered into negotiations with L. & P. Mfg. Co., Niagara Falls, Ont., for the assembly and distribution of the Fowler company's products in Canada. Construction Machinery Co. of Waterloo, Iowa, will begin production immediately on Fowler range burners for distribution west of the Mississippi river. (Noted Aug. 14.)

New York

BUFFALO — Flexlume Corp., 1100 Military road, manufacturer of electric signs, has filed plans for a plant addition to cost about $100,000.

BUFFALO—W. S. Eisele, 802 Tacoma street, has been incorporated with $5000 capital by C. C. Page, M. & T. building, to deal in sheet metal.

BROOKLYN—William F. Laramee has been incorporated with $20,000 capital by E. C. Morsch, 1008 Gates avenue, to deal in machinery.

HUDSON FALLS—New York Power & Light Corp., Albany, N. Y., is reported to be investigating a power site here, with prospective capacity of 100,000 horsepower.

LAUREL HILL—Laurel Hill Sheet Metal Works has been incorporated with $15,000 capital by J. H. Schulze, Hempstead, N. Y.

LOCKPORT—Cocker Saw Co. has been incorporated with 400 common shares by G. W. Riley.

LOCKPORT—Warehouse owned by William L. Kugler & Bro. was recently destroyed by fire.

NEW YORK—Loening Aeronautical Corp. has been incorporated with 200 common shares by Kurzman & Frank, 25 Broad street, to deal in airplanes.

NEW YORK—Broadway Ash Can Co. has been incorporated with $10,000 capital by P. L. Wellens, 299 Broadway, to deal in tinware.

NEW YORK—Eastern Metal Novelty Corp. has been incorporated with $15,000 capital by N. Elkin, 66 Court street, Brooklyn, N. Y.

NEW YORK—Utility Stoker Corp. has been incorporated with 200 common shares by M. Klausner, 1540 Broadway, to deal in coal burners.

NEW YORK—Cole Standard Grip-Nut Corp., whose incorporation recently was noted, advises through James G. Beeny, secretary, that the company is organized to place on the market a nut made in all standard sizes. Office of the company is 801 Times Square building, and Edward J. Cole is president. (Noted Aug. 14.)

ROCHESTER—Associated Autocraft Industries has been incorporated with $200,000 capital and 4000 common shares by Whitbeck & Dye, to deal in auto accessories.

Pennsylvania

HATFIELD—Council has approved a proposal for a municipal power plant. Cost is estimated at $45,000.

PHILADELPHIA—Kingsbury Machine Works, 4324 Tackawanna street, has awarded contract to S. D. Milner, 4616 Frankford avenue, for plant alterations and additions. Cost is estimated at $25,000.

TARENTUM — City will improve present equipment, install a new 1000-kilowatt generator in the light plant, and build an addition. Total cost, about $150,000.

New Jersey

ELIZABETH—Arrow Garage Inc. has been incorporated with 500 common shares by Weltchek & Weltchek, 80 Broad street, to manufacture airships.

NEW PROVIDENCE — American Telephone & Telegraph Co., 195 Broadway, New York, plans construction of a television research building on Mountain avenue. Architect is to be selected. Approximate cost, $40,000.

PASSAIC—Radiant Sign Corp. has been incorporated with $100,000 capital by Sigmund Unger, 585 Main avenue, to manufacture signs.

UNION CITY—Eastern Machinery Co. Inc. has been incorporated with $125,000 and 25,000 common shares by Adolph J. H. Peters, 746 Bline avenue, to deal in machinery.

UNION CITY—American Modernization Improvement Co. Inc. has been incorporated with $125,000 capital by Thomas P. Nolan to deal in machinery.

Ohio

BUCYRUS—Hangar unit valued at $10,000, owned by L. H. McBride, Bloomville, O., recently was destroyed by fire at the airport here.

CANTON—Power plant of the Republic Steel Corp. recently was damaged by an explosion. Loss is estimated at approximately $60,000.

CLEVELAND—John Carroll university will receive bids about Sept. 15 for a group of buildings costing $2,550,000. A power unit is to be built at an estimated cost of $50,000. Philip L. Small Inc., Terminal tower, is architect.

DAYTON—Globe Tool & Engineering Co., 124 Gilbert avenue, is taking bids on a 2-story plant, 30 x 90, to be erected at 420 Davis avenue. Cost is estimated at $4000.

DOVER—Peerless Machine Co. has been incorporated with 1000 common shares by Walter Robb and Zena L. Junkins.

NEW BREMEN—Dicke Brothers have organized the Pioneer Thermostat Co. here with $10,000 capital and plan to build a plant.

NORTH FAIRFIELD — Fairfield Plow Co. recently suffered fire loss at one of its plant buildings. Loss, including damage to several unoccupied units, $20,000.

SALEM—Garfield Tool & Die Co., Garfield, Mahoning county, O., will transfer operations here and may acquire the plant of the Salem Rubber Co.

TOLEDO—Toledo Saw & Grinding Co. has been incorporated with $25,000 capital by Richard A. McClure, 1303 Ohio Bank building.

YOUNGSTOWN—Anson Aero Mfg. Co. plans to build a 1-story plant unit for the manufacture of airplanes, on Meriden road. Estimated cost, $100,000.

Indiana

ANGOLA—Tri-State college will build a power plant. Estimated cost is $50,000.

ELKHART—Oil Heat Engineers Inc. has been incorporated with

$25,000 capital by Taylor J. Newell to manufacture and deal in heaters, stoves and burners.

FT. WAYNE—General Electric Co., E. A. Barnes superintendent, plans to build a plant unit at Winter street and Wabash railroad. Plans are private. Cost is estimated at $250,000.

INDIANAPOLIS—F. C. Tucker & Co., 215 Peoples Bank building, plans to build a machine shop and service station at East Washington street and Hawthorne Lane. Estimated cost, $40,000.

INDIANAPOLIS—Tri-Valve Pump & Mfg. Co. Inc. has been incorporated with $1500 by Henry D. Skiles, 2916 North Capitol avenue, to manufacture and deal in pumps.

INDIANAPOLIS—State Machinery Co. Inc. has been incorporated with 1000 no par shares by Edmund L. Peltier, 1809 Koehne street, to operate as machinists, toolmakers and steel converters.

INDIANAPOLIS—General Products Corp. has been incorporated with $50,000 capital by Ulysses G. Leedy, 5206 Grandview drive, to manufacture and deal in automobile heaters, windshield wipers and electric fans.

INDIANAPOLIS—Cartwright Automatic Gear Shift Corp., 1450 East Nineteenth street, advises through L. M. Cartwright, secretary, that production has been started on a new device for automatically shifting gears on automobiles. Initial production will be confined to units applied as a Ford accessory. Forest S. Cartwright is president of the company.

LAFAYETTE — Shell Corp. has awarded contract for a machine shop and service station at South and Fourth streets. Estimated cost, over $40,000.

NEWCASTLE—Grace Mfg. Corp. is in the process of organization here, for the manufacture of a safety device for punch presses. Frank Grace, inventor of the device, will be a member of the company. W. T. Van Camp of Newcastle Machine & Welding Co. will direct initial production on a small scale. Later expansion is planned.

Michigan

DETROIT—Metal Process Corp. is reported to have awarded contract to M. J. Hoffman Construction Co., Evansville, Ind., for a new plant for the manufacture of auto parts. Cost is estimated at $250,000.

DETROIT — Power Carburetor Corp., 7856 Cass avenue, has been incorporated with 125,000 no par shares by Charles K. Gates and Harry N. Miller to manufacture and sell carburetors and other accessories.

DETROIT — Detroit Gray Iron Foundry, 6403 Wight avenue, will need foundry equipment and motors for a plant addition recently noted as planned. Unit will be two stories, 115 x 170 feet, located on Meldrum avenue. Mildner & Eisen, 924 Hammond building, are architects. Cost will amount to about $50,000. (Noted May 1.)

GRAND HAVEN—City council will call for bids for a diesel engine unit addition to the power plant. Two diesel engines of about 960 kilowatts each, building unit, traveling crane and other items are included. Total cost is estimated at over $220,000.

LANSING—Oil Heating Co. has been incorporated with 2000 no par shares by T. A. Vandervoort and George D. Anderson to deal in oil, gas, coal and other kinds of heaters.

Illinois

CHICAGO—City council will soon inaugurate work on improvements to the municipal airport, as voted last spring. Improvements costing $450,000 include an administration building, to be constructed at a cost of about $75,000.

CHICAGO—Chicago Metal Cleat Mfg. Co., 6619 North Campbell avenue, has been incorporated with 250 no par shares by Lawrence T. Spellen, 333 North Michigan avenue, to manufacture metal cleats and products.

CHICAGO—Belmont Heat Control Corp., 2510 North Crawford avenue, has been incorporated with 5000 no par shares by George L. Lewis, 100 North LaSalle street, to deal in heat control devices.

CHICAGO—Foundry Systems Inc., 112 West Adams street, has been incorporated with $50,000 capital by Gilbert T. Graham, 160 North LaSalle street, to engage in a mercantile and engineering business.

CHICAGO — Electra Corp., 1500 North Kostner avenue, has been incorporated with $50,000 capital by Julius H. Quasser, 7 South Dearborn street, to deal in machinery.

CHICAGO — Consolidated Body Corp., 45 South Wells street, has been incorporated with $50,000 and 100 no par shares by Lester Witte & Co., 120 South LaSalle street.

CHICAGO—Gordon & Gordon Inc., 535 South Franklin street, has been incorporated with $10,000 capital by Arthur R. Weinstein, 29 South LaSalle street, to manufacture and deal in lamps and shades.

CHICAGO—Chicago Surface Lines, 231 South LaSalle street, advises that its car house at 2357 West Division street, being altered as recently noted, will contain a crane runway about 220 feet long, on which will be mounted one 7½ ton traveling crane. (Noted Aug. 21.)

EAST ST. LOUIS—Ramapo-Ajax Corp., 301 South Main street, manufacturer of railroad track equipment, has a building permit to remodel a plant unit at a cost of $5000, for the manufacture of frogs and switches for railroads. Unit will add 2500 square feet of floor space. Machinery will be installed. Dickson Fairback is vice president in charge of the plant.

GARY—Zweig Iron Works has been incorporated with $10,000 capital by Joseph Kapsh and Benny Zweig, to engage in a structural and ornamental iron, steel and sheet metal business.

MT. VERNON—Mt. Vernon Furnace & Mfg. Co. is moving the business of Universal Stove Co., St. Louis, recently purchased, to its own plant here.

Southern States

BIRMINGHAM, ALA.—W. E. Mathews, P. O. Box 632, Ensley, Ala., a suburb, is inquiring for tool room equipment and used small punch presses. Plant will be erected to manufacture reinforcing steel specialties.

DECATUR, ALA.—Jervis Machine Co. has been granted a building permit for an addition to its plant. Cost is estimated at $400.

MONTGOMERY, ALA. — U. S. Army, Capt. M. A. McFadden, constructing quartermaster in charge, will call for bids for four hangar units, 110 x 240 feet. Plans are nearing completion.

WILMINGTON, DEL.—Jos. A. Trainor Inc. has been incorporated with $10,000 capital by Corporation Trust Co., duPont building, to deal in machinery.

WILMINGTON, DEL.—Nagel Aircraft Inc. has been incorporated with 50,000 common shares by Corporation Service Co., Delaware Trust building, to deal in airplanes.

PENSACOLA, FLA. — Pensacola Aero Corp. has been incorporated by B. M. Hill, 108 West Romana street, to deal in airplanes.

LOUISVILLE, KY.—Younger Furnace Co. has been incorporated with $35,000 capital by J. Younger, 1025 East Market street.

BALTIMORE—Parker Metal Decorating Co., Howard and Ostend streets, will expand its facilities for the manufacture of metal specialties through the lease of 20,000 square feet of floor space at Paca and Cross streets. Present unit will continue the manufacture of tin cans.

STATESVILLE, N. C.—Turner Mfg. Co. has been incorporated by D. A. Mathews and R. S. Dickson to manufacture farm implements.

WINSTON-SALEM, N. C. — R. J. Reynolds Tobacco Co. plans to build a 2-story power plant extension, 56 x 80 feet, at Fourth street and Patterson avenue. J. E. Sirrine & Co., 215 South Main street, Greenville, S. C., are architects. Cost is estimated at $45,000.

COOKEVILLE, TENN.—State department of education, Nashville, Tenn., plans to build a 3-story science building here at a cost of approximately $225,000. R. H. Hunt, James building, Chattanooga, Tenn., has plans.

MEMPHIS, TENN. — Virginia Bridge & Iron Co. is erecting a plant addition. Estimated cost, $8000.

MURFREESBORO, TENN.—State department of education, Nashville, Tenn., will erect a 3-story science building here. Plans are by Marr & Holman, Stahlman building, Nashville,

Tenn., and cost is estimated at $225,000.

LYNCHBURG, VA.—Better Products Machinery Co. Inc. has been incorporated by John B. Winfree Jr., 1007 Federal street, to manufacture mechanical devices.

CHARLESTON, W. Va.—Appalachian Electric Power Co., through its subsidiary, West Virginia Power Co., has filed plans for two hydro-electric power projects at Hinton, W. Va., and Bull Falls, near Hinton. Bull Falls project will include a power station with a capacity of 168,000 horsepower. Hinton project will include a power station with a capacity of 31,000 horsepower. Combined total costs will amount to $16,750,000.

LOGAN, W. VA.—Guyan Machine Shops Inc. is in the market for a boring mill, 5-ton crane, drills, motors, hoists, and welding machines.

Missouri

KANSAS CITY—Black, Sivalls & Bryson Inc., 7500 East Tenth street, is erecting a machine shop addition, 46 x 48 feet. Company manufactures tanks.

SPRINGFIELD — Bodine Ice Machine Co. has acquired the local plant of the United Iron Works.

Oklahoma

ENID—Champlin Refining Co. will build a pipe line, to include pumping stations, from its refinery here to the Oklahoma City field by way of Lovell, Okla.

GEARY — City, T. J. Stephenson clerk, will receive bids Sept. 4 for two 300-gallons per minute motor-driven pumps for waterworks improvements. Approximate cost, $40,000.

JASPER—Ozark Reduction Co., Little Rock, Ark., plans to build a hydro power plant on the Buffalo river near here at a total cost of over $1,000,000.

OKLAHOMA CITY—National Aircraft Inc. has been incorporated by Claude E. Aikman, 909 East Eighteenth street, to deal in airplanes.

TULSA — Resistcor Engineering Corp. plans to enlarge its machine shop at 13 North Cheyenne avenue soon. B. Bardsley is shop manager.

TULSA—Mid-Co. Oil Well Tool Co., Tuloma building, William J. Ross president and R. C. Mason mechanical engineer in charge of manufacturing, will construct its first unit, a machine shop, 40 x 140 feet, and will manufacture and distribute oil well tools and measuring devices. Company was recently incorporated with a capital of $250,000.

Texas

DALLAS—Texas Aero Service & College Inc., Hampton airport, located in Oak Cliff suburb, will build hangars and shops soon. R. S. Johnson is president of the company.

GALVESTON—University of Texas board of regents, J. W. Calhoun comptroller, Austin, Tex., plans to build a 3-story laboratory here at a cost of about $350,000. H. Greene, LaRoche & Dahl, 307 Constructors Industrial building, Dallas, Tex., are making plans.

LAREDO—H. P. Henderson, 522 Fifth avenue, New York, and associates plan to erect a plant to smelt antimony from Mexican mines. Cost is estimated at $125,000. J. B. Harper, San Diego, Calif., is engineer.

LULING—Petroleum Machine & Supply Co. has been incorporated with $50,000 capital by Claude Ussery, president and general manager, to manufacture oil field equipment.

PAMPA—Standard Pipe & Metal Co. has been incorporated with $10,000 capital by N. W. Rudman to deal in pipe and second hand metals.

Wisconsin

MILWAUKEE—Gunderson Motive Power Co. has been incorporated with 500 no par shares by Oliver Webb, 544 Forty-ninth street, to manufacture machinery, boilers and turbines.

MILWAUKEE—Filer & Stowell Co., 219 Becher street, manufacturer of sawmill machinery and engines, will award contracts for a 3-story addition, 70 x 85 feet. E. C. Read is vice president.

MILWAUKEE — Department of public works, city hall, closes bids Sept. 9 for three 2500-gallons per minute centrifugal pumps, motor driven, for the proposed new fire service pumping station to be built on the Kinnickinnic river. David McKeith is commissioner of public works.

RACINE — Badger Brake Tester Mfg. Co. has been incorporated with $25,000 capital and 1000 common shares by Harrison D. Flegel and Harry T. Johnson.

Kansas

ABILENE—United Power & Light Corp. of Kansas is receiving bids for a machine shop, 40 x 48 feet, to be built in connection with a garage, 40 x 100 feet. Murray & Cayton are architects.

Colorado

LAKE CITY—R. D. Webb plans to erect a hydroelectric power plant on the Lake fork of the Gunnison river, near here. Cost of the project is estimated at about $500,000.

Pacific Coast

ALAMEDA, CALIF.—Zemco Mfg. Co. Ltd. has been incorporated by J. M. Zarwell to manufacture and sell electrical apparatus.

ALAMEDA, CALIF.—Alameda Bay Airdrome has awarded contract to Lindgren & Swinerton Inc., 225 Bush street, San Francisco, for a hangar and administration building, 120 x 440 feet, to be built on Webster street. Cost will approximate $100,000.

LOS ANGELES—Los Angeles Can Co., 301 San Fernando boulevard, is reported to be planning a plant to cost $175,000

LOS ANGELES—Consolidated Steel Corp., 1200 North Main street, recently suffered fire damage to its plant. Principal damage, estimated at $50,000, was done to a warehouse.

LOS ANGELES—Consolidated Steel Corp., 1200 North Main street, proposes to build a plant for structural steel operations and for the manufacture of bolted tanks and pontoon decks, at Slauson and Eastern avenues. Plans are private.

LOS ANGELES—United Airports Co. of California Ltd., operating United Airport, a division of United Aircraft & Transport Corp., Hollywood way, Burbank, advises through Fred Denslow, airport manager, that original plans have been changed. A hangar unit 240 x 300 feet will be constructed, to be one of the most fully equipped hangars in the western territory. Contract is being let. Upon completion another unit of similar size will be erected. (Noted Aug. 7.)

OAKLAND, CALIF.—Trumbull Electric Mfg. Co., Plainville, Conn., John H. Trumbull president, is reported to be inspecting plant sites here for erection of a Pacific Coast plant.

OAKLAND, CALIF. — East Bay Municipal Utility district, 512 Sixteenth street, J. H. Kimball secretary, is inquiring for a completely equipped 200-ampere electric welder, engine-driven, mounted on steel skids.

OROVILLE, CALIF.—County purchasing agent F. W. Boyle is in the market for highway and other equipment, including tractors, jack hammer and repair shop items. Total cost is estimated at $17,500.

REDONDO BEACH, CALIF.—Redondo Beach Union high school district is receiving bids for a shop and gymnasium. Allison & Allison, Hibernian building, Los Angeles, are architects.

SAN FRANCISCO—L. O. Ebbetts, architect, Call building, is preparing plans for an unnamed interest for the construction of a 2-story automobile assembly plant in Mission district. Cost is estimated at over $100,000.

SAN FRANCISCO—Eng-Skell Co., 208 Mission street, manufacturer of soda water fountains and equipment has a 3-story plant, 100 x 200 feet, under construction, as recently noted. Company is in the market for a boiler and tanks, a turbine well pump, vacuum pans, and canning machinery. Other items probably to be purchased include steel sash, reinforced steel, barometric condenser, and rolling door. (Noted June 5.)

SAN LUIS OBISPO, CALIF.—Contract has been awarded to Theodore Maino for additions to San Luis Obispo junior high school, including a shop building. Cost of the project is estimated at over $60,000.

SOUTH SAN FRANCISCO, CALIF.—Seattle Chain Mfg. Co., 6921 East Marginal way, Seattle, has awarded contract for a 1-story plant here. Cost is approximately $40,000.

PORTLAND, OREG. — McPherson Furnace & Supply Co., East Second and Schuyler streets, is taking bids for a 100 x 100-foot warehouse. Cash & Wolff are architects.

PORTLAND, OREG.—Iron Fireman Mfg. Co., manufacturer of automatic coal stokers, is reported to be arranging for plant facilities which will double plant capacity.

PORTLAND, OREG.—Department of public docks will require elevating, conveying, screening and other equipment for use in a new grain elevator to be built at a cost of $275,000. General contract is held by Albertson-Cornell Brothers, 113 A street, Tacoma, Wash.

TEN MILE, OREG.—J. G. Barnes, C. Powell and J. Rathkey plan to construct a light and power plant on Ten Mile creek, to include a power house, generating and distributing machinery.

SEATTLE—Municipal power department plans a power substation to cost $50,000.

SEATTLE—Reliance Tool Co. has been incorporated with $250,000 capital by Israel Nelson, attorney, Central building.

SEATTLE—Wilson Valve Co. has been incorporated with $100,000 capital by Paul W. Houser, Hoge building, for C. W. Wilson and associates.

SEATTLE—Diesel Service & Engineering Co. has been incorporated with $1500 capital by Bronson, Jones & Bronson, attorneys, Colman building, for J. W. Remington, to engage in machine shop work and engineering service.

Dominion of Canada

LETHBRIDGE, ALTA.—Council will call for bids soon for a power plant addition, new turbines, and two boilers. S. Steedman is city clerk.

NEWCASTLE WHARF, N. B.—New Brunswick Electric Power Commission, 55 Canterbury street, St. John, N. B., plans to erect a $750,000 power plant here.

ABITIBI CANYON, ONT.—Ontario Power Service Corp. Ltd., subsidiary of Abitibi Power & Paper Co. Ltd., 88 University avenue, Toronto, Ont., has awarded contract to Dominion Construction Co. Ltd., Reford building, Toronto, for construction of a power plant here to have a capacity of 275,000 horsepower. Total cost of the project is estimated at $20,000,000. Construction will begin immediately and will be completed in about two years.

GALT, ONT.—Galt Malleable Iron Co., H. J. Bassett general manager, Kerr street, whose plant recently was noted as having been damaged by fire, is in the market for foundry equipment for a proposed 1-story addition, 62 x 162 feet. (Noted May 22.)

HAMILTON, ONT. — Canada Iron Foundries Ltd., W. A. Hastings manager, Queen street, is in the market for equipment for machine and patternmaking shops, which were recently destroyed by fire. (Noted Aug. 14.)

KINGSTON, ONT.—Cohen & Co., metal dealers, have applied for a permit to erect two units in connection with their smelter. Units will be 40 x 40 feet and 20 x 20 feet.

TORONTO, ONT.—Reflex Sign Co. Ltd. has been incorporated with $40,000 capital by Norman R. Tyndall, 201 Lee street, to manufacture and deal in electrical and other signs.

LONDON, ONT.—Taylor Electric Mfg. Co., 526 Adelaide street, advises through A. T. Taylor, president, that the company is interested in electrical riveting hammers and a drop hammer press. Company proposes to build a 50 x 100-foot plant unit, costing about $20,000.

MONTREAL, QUE.—Universal Industries & Arts Ltd. has been incorporated with $19,000 capital by Horace J. Gagne, 107 Craig street west, to manufacture and deal in electrical apparatus, labor saving devices and household utensils.

New Trade Publications

CRANE BRAKE—Electric Controller & Mfg. Co., Cleveland, in a current bulletin presents a brake designed for cranes, having ease of access to its parts, simple adjustment and long wear.

STANDARDIZED BUILDINGS — A broadside by the Truscon Steel Co., Youngstown, O., covers its standardized steel buildings, diagrams showing types available. Illustrations indicate the range of buildings in which they have been used.

HEATING FURNACES — Electric Furnace Co., Salem, O., is circulating a bulletin on its oil and gas-fired continuous and batch-type billet heating, forging and car-type furnaces for heating, normalizing and heat treating. Labor-saving material-handling equipment is also described.

PUNCHES AND RETAINERS — Whitman & Barnes Inc., Detroit, has issued a catalog of its interchangeable punches and retainers. It contains much information on punches for piercing metal. The foreword explains the principles of this new system of punches and retainers and their application.

SHEET METAL PAINT—A bulletin by the American Chemical Paint Co., Ambler, Pa., covers preparation of sheet metal surfaces for painting. Photomicrographs show attacks of rust on metal surfaces cleaned by various means, contrasted with one cleaned by the company's cleaning preparation.

SPEED TRANSMISSION — Reeves Pulley Co., Columbus, Ind., describes in a current bulletin its variable speed transmission with electric automatic control and electric remote control. It is illustrated and full description is given of its construction and operation.

CALCIUM MOLYBDATE—A booklet by the Climax Molybdenum Co., New York, covers the subject of calcium molybdate as a means of alloying steel with molybdenum. The book points out the advantages and limitations of the material and indicates the best means by which it is employed in metallurgical processes.

DIESEL ENGINES—Worthington Pump & Machinery Corp., Harrison, N. J., devotes a 44-page bulletin to its vertical four-cycle air-injection diesel engines. Copious illustrations supplement the description in the text and present numerous installations in varied use. Diagrams show details of various sizes.

FLEXIBLE COUPLINGS—Westinghouse Electric & Mfg. Co., Nuttall Works, Pittsburgh, has issued a bulletin on its flexible couplings of various types for steel mill machinery. The several types are illustrated and data are given to guide in selection of the proper coupling for a given installation. Another bulletin from the same source relates to speed reducers, containing descriptions and illustrations of the reducers and applications to various uses.

OIL ELECTRIC LOCOMOTIVES—An illustrated publication by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., covers its oil electric locomotives and rail cars. It contains a description of applications, operation and construction of oil electric traction devices and photographs and diagrams of many locomotives and cars.

SCREW MACHINES—Davenport Machine Tool Co. Inc., Rochester, N. Y., has issued a bulletin on its multiple-spindle automatic screw machine of high production and precision. A point in its design is independent feed for each tool. Full description is given and many illustrations show details of construction and operation.

INDUSTRIAL LOCOMOTIVES—Mine and industrial locomotives produced by the Baldwin-Westinghouse interests are described in a bulletin published by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and the Baldwin Locomotive Works, Philadelphia. It contains a photograph, a drawing and data covering performance and the electrical and mechanical construction of each of 17 mine locomotives and seven industrial locomotives. They include both trolley and storage battery types.